

NETWORK WORLD

The Newsweekly of User Networking Strategies

Volume 7, Number 26

An International Data Group Publication

June 25, 1990

3Com maps strategy for coexistence

By Susan Breidenbach
West Coast Bureau Chief

SANTA CLARA, Calif. — The cold war among network operating system vendors continued to thaw last week as 3Com Corp., with archrival Novell, Inc. in attendance, spelled out plans to make its equipment interoperable with competitors' offerings and rolled out products to support that goal.

Company President Eric Benhamou said 3Com, which was trying at one point to be a one-stop shop, is carving out a new role as a systems integrator offering solutions to global data networking problems. As such, 3Com will be stressing interoperability with the huge installed base of Novell's NetWare, rather than trying to replace it.

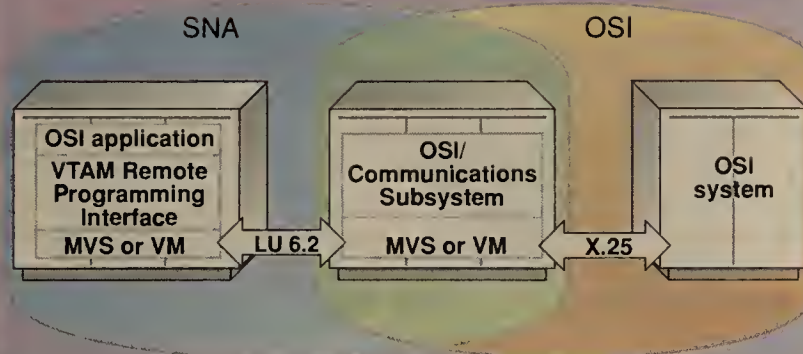
Underscoring this promise is one of the new products officially unveiled at last Monday's event: 3+Open Connection for NetWare, which enables DOS clients to access both LAN Manager and NetWare servers through a single LAN connection.

The other new 3+Open enhancements are Macintosh support, a menuing system, a directory service, and TCP/IP and Xerox Corp. Xerox Network Systems protocol stacks.

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Melding SNA and OSI networks

IBM offers SNA support for distributed OSI applications



IBM's new VTAM Version 3 OSI Remote Programming Interface Feature lets OSI applications on SNA hosts exchange data with remote OSI hosts via a mainframe supporting IBM's OSI/Communications Subsystem.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: IBM, WHITE PLAINS, N.Y.

RBHCs' foreign investments rankle U.S. network users

Users concerned that capital poured into overseas ventures could be better spent on U.S. public net.

By Bob Brown
and Barton Crockett
Network World Staff

There is growing concern that the regional Bell holding companies' multibillion-dollar investments in overseas ventures represents a flight of capital that would be better used to improve the U.S. public network.

Industry observers are questioning the effectiveness of a regulatory system that allows the RBHCs to spend billions abroad that could be used to introduce domestic services, and they warn

that U.S. ratepayers may be footing the bill for RBHC expansion efforts.

The issue has come to the fore because of a spate of recent RBHC investments abroad. Among other deals, Bell Atlantic International, Inc. recently teamed with Ameritech to make the largest RBHC foreign investment to date, the \$2.4 billion purchase of New Zealand's national telephone system ("Ameritech, Bell Atlantic acquire New Zealand's telephone company," *NW*, June 18).

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IBM cements ties between SNA, OSI

Offers VTAM tool for distributed OSI applications, OSI for RISC systems, TCP/IP support for NetView.

By Paul Desmond
Senior Editor

NEW YORK — IBM last week broadened its suite of multivendor networking products with new software that makes it easier to meld IBM Systems Network Architecture networks with nets based on Open Systems Interconnection standards.

The company also delivered on its promises to give NetView the ability to manage devices on

mation Protocol.

While the paper includes no new announcements, it assembles in a single document IBM's statements regarding standards. IBM has mailed the statement to customers, and it is also available on the *Network World* bulletin board (see "Accessing IBM's" (continued on page 56)

IBM unveils FDDI plans, Ethernet products. Page 56.

Transmission Control Protocol/Internet Protocol nets and to extend OSI support to AIX, its version of Unix.

IBM contends that the announcements are a milestone on the path to multivendor networking and underscore the company's commitment to international and de facto standards, an assessment with which analysts concurred.

To further illustrate that commitment, IBM issued a position paper on OSI that outlines the company's stance on everything from OSI's role in IBM's Systems Application Architecture to support for the Manufacturing Auto-

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ICA President-elect Phillip Evans shares his vision for the group. Page 23.

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FCC ACTION ON AT&T's Tariff 15 discount plan leaves users up in the air. Page 2.

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MCI'S VISION gives small and midsize users perks usually reserved for the big guys. Page 6.

MUSIC INDUSTRY FINDS harmony in networking. Page 36.

FEATURE



Impending regulatory changes favor users

By Alan Pearce
Special to Network World

Government regulation is the strongest force shaping the infrastructure of the U.S. public telecommunications network today. The regulators' lofty goal is to bring users a wide array of reasonably priced, universally available telecommunications and information services.

What regulatory progress is being made on the federal and state levels? And what changes

can users expect?

Regulatory trends determining the evolutionary course of public and private networks include:

■ The regional Bell holding companies will win new business opportunities but will remain regulated fairly rigidly at the federal and state levels.

■ AT&T will be given some regulatory freedom because of the Federal Communications Com-

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Application needs outrun net staffers

By Wayne Eckerson
Senior Writer

Network departments are being deluged with demands for network applications and are facing a growing development backlog that may soon rival the application backlog that has plagued information systems (IS) for years.

Net managers and consultants say that end users and upper management are clamoring for deployment of a vast array of network technologies and applications, including electronic data interchange, local-area nets, imaging and videoconferencing.

At the same time, many com-

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Tariff 15 takes effect, but FCC sidesteps legality issue

Fate of Tariff 15 still in doubt, although agency lets user move ahead with AT&T discount plan.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The Federal Communications Commission last week allowed AT&T's controversial Tariff 15 deal for Resorts Condominium International, Inc. (RCI) to take effect but did not rule on whether customer-specific discounts offered through Tariff 15 are legal.

RCI's Tariff 15 deal, which had been in a legal holding pattern at the FCC for five months, was filed in response to an offer from MCI Communications Corp. that AT&T claims contained off-tariff prices for Vnet and 800 services. AT&T told the FCC that unless it was allowed to match MCI's offer,

RCI would switch to MCI.

Even though RCI's deal went through, users remain uncertain about the fate of Tariff 15 because the FCC still has the authority to declare the tariff unlawful at any time. And since the FCC didn't find Tariff 15 lawful, customers with pending Tariff 15 deals cannot be sure whether the agency will suspend or reject them in the future.

This uncertainty has already prompted one potential customer — CBS, Inc. — to sign on with another carrier for service. According to James Halsey, vice-president of MIS for CBS, concerns about legal problems were
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Vendors admit they need to improve LAN control tools

PC Expo panel discusses evolving user needs.

By Tom Smith
New Products Editor

NEW YORK — Top local-area network vendors last week admitted they've been slow to meet user needs for multivendor LAN management tools.

Speaking at a PC Expo panel here, representatives of Digital Equipment Corp., IBM and Novell, Inc. said the explosive growth of LANs has made it difficult for them to address users' expanding management requirements and acknowledged that they must broaden the capabilities of their management tools to support multivendor LANs.

Raj Rajan, advisory product planner for LAN management products at IBM, said users need tools that seamlessly integrate LANs into existing net management systems.

"The tools don't exist today, and we're working feverishly to provide them," he said.

Rajan acknowledged that IBM has not adequately integrated LANs into its NetView host-based net management system.

IBM sells Personal System/2 software, dubbed LAN Manager Version 2.0, that acts as a NetView service point, collecting informa-
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US Sprint files ISDN PRI tariff with service pricing

By Bob Wallace
Senior Editor

US Sprint Communications Co. has filed its ISDN Primary Rate Interface (PRI) tariff with the Federal Communications Commission, leapfrogging MCI Communications Co. to become the second interexchange carrier to offer PRI and providing AT&T with stiff price competition on automatic number identification (ANI) service.

The carrier outlined pricing for Integrated Services Digital Network PRI and three features: ANI, call-by-call service selection and VPN-PBX Feature Interworking, which lets PRI-equipped private branch exchanges share call data and support one set of fea-

tures across a virtual private net.

"A wide range of users will find US Sprint's [PRI] service pricing and features quite appealing," said Joseph Baylock, Enterprise Network Strategies Program Director for Gartner Group, Inc., a Stamford, Conn.-based consulting and research firm.

Matrixx Marketing, Inc., an Ogden, Utah-based telemarketing service bureau, is the first commercial user to implement the service (see "User lauds US Sprint PRI," page 59).

US Sprint's PRI service — which can be used to access the carrier's Ultra 800, Ultra WATS, Switched Digital Services and Virtual Private Network offerings —
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Briefs

The security factor. Two mathematicians last week successfully factored a 155-digit number, a feat that calls into question the integrity of encryption systems based on factoring. Arjen Lenstra of Bell Communications Research and Mark Manasse of Digital Equipment Corp. successfully factored the number by tapping into almost 1,000 computers worldwide and running their calculations during off-peak periods.

Factoring a number involves finding the prime numbers that divide it. Prime numbers are divisible only by one and the number itself. The 155-digit number was targeted because it has long been considered to be unfactorable and because it is the size commonly used to encrypt computer messages. "Breaking this number clearly sends a message to cryptographers that they should avoid basing a message on any factorable number less than 200 digits — or risk a major security breach," Manasse said.

Rolm to sell refurbished PBXs. Rolm Co. last week announced an agreement with Norstan, Inc. under which Norstan will refurbish Rolm private branch exchanges. Norstan, a Minneapolis-based supplier of new and used telephone equipment, will resell the PBXs, as will Rolm's direct sales force. Rolm claims it will be the only major PBX vendor whose direct sales force sells both new and used equipment. The companies will remarket CBX 8000, CBX 9000 and VSCBX PBXs, as well as parts for those models and the CBX 7000 line. Norstan

will provide telemarketing support for Rolm's sales efforts, while Rolm will be the customer contact for service and upgrade sales.

FCC orders telcos to cut charges. The Federal Communications Commission last week ordered the nation's local telephone companies to reduce access charges to long-haul carriers by \$1.1 billion during the next 12 months. The cuts are \$696 million greater than the \$405 million in cuts the companies proposed last April. Long-distance service providers are likely to pass along the savings in the form of lower long-distance rates to consumers and small businesses.

Net/Master gets Tandem view. Systems Center, Inc. and Tandem Computers, Inc. this week will announce an agreement to develop network management software for Tandem's NonStop fault-tolerant computers that will make it possible to integrate the systems into networks controlled by Systems Center's Net/Master. The net management software will be written using the Net/Master fourth-generation Network Control Language and will act as a peer to Net/Master, which is used to manage IBM Systems Network Architecture nets. The two systems will be able to exchange net management data, and either can be configured as the focal point for the system. The two companies declined to say when they expect the first products to be available.

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Telecommunications

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Data Communications

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Local Networking

AT&T's network product blitz will help make the company one of the top computer network suppliers in the 1990s. **Page 21**

Management Strategies

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International Networks

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Network World
161 Worcester Road
Framingham, Mass. 01701-9172
(508) 875-6400

Second-class postage paid at Framingham, Mass., and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-820-7444.

Non-qualified subscribers: \$3.00 a copy; U.S. — \$95 a year; Canada, Central & South America — \$110 a year; Europe — \$165 a year, all other countries — \$245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label appearing on front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106.

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DEC product blitz features firm's first 10BaseT wares

Cabling system, LAN software round out rollout.

By Tom Smith
New Products Editor

NEW YORK — Digital Equipment Corp. last week unveiled its first 10BaseT products at PC Expo here, including a personal computer interface board, an eight-port hub and a media access unit.

The company also replaced its proprietary DECconnect wiring scheme with a new cabling system based on unshielded twisted-pair wiring and introduced software that enables Novell, Inc. NetWare local-area networks to exchange data over a DECnet backbone.

Finally, the company rolled out software that enables LAN-attached microcomputers to access Digital Standard MUMPS data bases residing on DEC VAXes and earlier generation PDP-11 mini-computers.

Analysts said the announcements indicate that DEC is finally coming to terms with user demands for a more economical and efficient wiring plan than

DECconnect, which was regarded as a costly cabling alternative to telephone wiring.

"DEC has finally realized it has to be more competitive with everything it offers to get the attention of buyers," said Terry Shannon, manager of the DEC Advisory Service at International Data Corp. in Framingham, Mass.

EtherWorks debuts

The new 10BaseT Ethernet interface, the DEC EtherWorks Turbo/TP, is a 16-bit controller card for personal computers based on either the Industry Standard Architecture or the Extended Industry Standard Architecture. It connects a personal computer into a 10BaseT LAN.

The card has software drivers for DOS and OS/2, and it supports DEC's LanWorks software, which allows VAXes or Micro-VAXes to function as application, file or print servers for OS/2, DOS, VMS and Apple Computer, Inc. Macintosh clients.

By the time it ships in September,

the interface will be certified by Novell for compatibility with NetWare Version 2.15 and by Microsoft Corp. for compliance with its Network Driver Interface Specification (NDIS).

By including NDIS-compliant drivers, DEC will assure that the card can be used in LANs running NDIS-compliant operating systems, including NetWare and 3Com Corp.'s 3+.

DEC EtherWorks Turbo/TP comes with 64K bytes of cache memory, which enables it to achieve faster throughput than 3Com's EtherLink II TP interface, DEC said.

DEC also announced that its existing Ethernet interface cards, previously known as Digital Ethernet Personal Computer Adapters, have been renamed as DEC EtherWorks interfaces.

DEC's newly announced 10BaseT hub, the DEC repeater 350, has eight ports for connection to 10BaseT nodes, as well as a single attachment unit interface (AUI) port for connection to a backbone Ethernet supporting thin-wire Ethernet cabling. Workstation attachments are configured in a star topology.

Last week's announcement also included the Digital Unshielded Twisted Pair Media Ac-

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Exchanges eye after-hours electronic trading nets

NYSE, AMEX and others draft nighttime trading plans, seek to woo trading from rival exchanges.

By Barton Crockett
Senior Editor

Stock, futures and options exchanges around the world are moving ahead with plans for after-hours electronic trading systems, but it's unclear whether these new trading tools will give any exchange a competitive edge.

Last week, the American Stock Exchange, the Chicago Board Options Exchange and the Cincinnati Stock Exchange announced plans to work with Reuters Holdings PLC to offer in 1992 a shared electronic trading service that would operate after regular exchange hours.

Two weeks ago, a front-page story in *The New York Times* reported that the New York Stock Exchange (NYSE) told major brokerage firms it plans to cut over an after-hours electronic trading network next year. In addition, the Chicago Mercantile Exchange and the Chicago Board of Trade recently agreed to build a shared after-hours trading net instead of pursuing individual nets. The merged network, which would be more cost-effective, could become operational later this year, according to officials at the two exchanges.

Exchanges are looking to electronic trading to increase revenues by helping them lure trading from overseas exchanges.

But industry observers question how much demand will materialize for these network-based services and how useful a competitive tool they will be, particularly if most exchanges end up building them.

"My guess is that everybody will have them, but for different reasons," said Eric Clemons, associate professor of decision sciences and management at the University of Pennsylvania's Wharton School in Philadelphia. "Ultimately, when everybody has them, I don't really expect them to move [market] share."

After-hours electronic trading promises to help the exchanges capitalize on the increasingly globalized trading market.

Over the past few years, foreign exchanges have offered an increasing number of stocks, futures and options contracts similar to those traded on exchanges in the U.S.

Exchange officials say after-hours trading systems could persuade traders dealing in these financial instruments overseas to bring their business to the U.S.

"It's a necessary evil," a Chicago Board of Trade spokesman said. "There is no way around the fact that investors are looking for these on a 24-hour basis."

But some observers question

whether brokerages will actually commit to trading electronically at night. A critical factor will be liquidity — whether the services can woo enough traders to make it easy to buy and sell stocks. Low transaction costs will also be important.

"Really, it's liquidity first and transaction costs second," said Peter Karpen, a director for futures and options activities at the New York investment firm First Boston Corp. "It's possible the

“There is no way around the fact that investors are looking for these [trading systems] on a 24-hour basis.”

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electronic trading systems will be more liquid and have lower costs, but nobody really knows yet." Karpen is also cochairman of the automation committee of the Futures Industry Association, a trade group.

Even if the exchanges can create viable markets through electronic trading, some observers say the ubiquity of these services may make it difficult for any one exchange to steal trading volume from another.

"If an exchange puts one of these in, it can move market share if no one else [builds a trading network]," Clemons said. "But if everyone else does, then quality, liquidity and fairness will be the deciding factors."

He added that these factors favor the primary exchanges, rather than other exchanges that try to cut in on the primary exchange's business. For this reason, he said, trading networks will probably help major exchanges hold on to the market share they already have, rather than help them increase market share at the expense of others. ■

Correction: Due to an editing error, we incorrectly reported the status of Nynex's trial on criminal contempt charges as violating the Consent Decree ("Washington Update," NW, June 18). Nynex requested a jury trial, and the Justice Department opposed the request. The court has not issued a decision.

Soderblom suffers patent setbacks in the U.S., U.K.

Rulings may negate token-ring license deals.

By Laura DiDio
Senior Editor

LONDON — Token-ring patent holder Olof Soderblom was dealt a double blow last week when a high court here dismissed a patent infringement suit he brought against Madge Networks, Ltd., and U.S. patent officials repealed several claims he made in a previous patent application.

While Soderblom and his attorneys said they will appeal both decisions, the rulings may eventually render null and void the current licensing agreements Soderblom has with more than 50 vendors of token-ring and 100M bit/sec Fiber Distributed Data Interface products, including IBM.

No infringement

In the High Court of the U.K., the chief patent justice ruled that Madge Networks' token-ring products do not infringe on a token-passing patent Soderblom holds.

In rendering his decision last Friday, the judge said, "A claim so wide as to monopolize token-ring technology is not fairly based. Madge [Networks] products and other token-ring products that comply with the IEEE 802.5 standard rely on a totally different system from that covered by Soderblom's invention."

Soderblom sued Madge Networks in October 1987 for patent infringement in the U.K. and sought royalty payments. Madge countersued, claiming that Soderblom's patent did not cover IEEE 802.5 token-ring technology.

Patent office decision

Late Friday, the U.S. Patent and Trademark Office, which has been reexamining the applicability of Soderblom's 1981 U.S. patent, issued a decision that negated its 1984 ruling broadening the scope of the Soderblom token-passing patent.

Patent office officials said several key claims that the office allowed in 1984 dealing with open and closed data transmission loop schemes were actually invented by AT&T engineers in the 1970s and not by Soderblom.

Some vendors that currently pay royalties to Soderblom said the patent office's decision will ultimately negate Soderblom's right to extract licensing fees on their token-ring and FDDI products.

Robert Madge, president and founder of Madge Networks, said he was elated by the U.S. patent office's and the U.K. high court's decisions.

"Our aim throughout this pro-

cess has been to get a clear decision in a court of law to settle Soderblom's claim once and for all. The myth of Soderblom as the father of token ring has finally been laid to rest," Madge said.

Madge and Soderblom are currently suing each other in a federal district court in San Francisco over the validity of the patent. That case is scheduled for trial in January 1991.

Based on last week's actions, Dean Bostock, Madge Networks' Boston-based attorney, said he will seek an injunction this week in a San Francisco federal court to deny Soderblom's petition to prohibit Madge Networks from shipping its token-ring products because they allegedly infringe on his patent.

"We are now asking Chief Judge William Ingram of the federal district [court] to deny Soderblom's motion for an injunction because the U.S. patent office has rejected the claim on which that motion is based," Bostock said.

Not yet begun to fight

Soderblom, reached at his home in Surrey, England, last Friday, said he is not discouraged by last week's events.

"We were anticipating exactly this action by the U.S. patent office. We'll file our reply briefs this week, and if the patent office disallows our claims, then we will appeal," Soderblom said. "However, this doesn't change the fact that my patent is still valid." He also said he will appeal the U.K. court's ruling. ■

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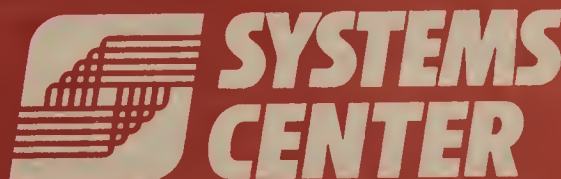
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MCI airs service package aimed at smaller users

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — MCI Communications Corp. last week introduced a new outbound long-distance service package called MCI Vision targeted at small and midsize business customers that spend up to \$50,000 per month on service.

MCI Vision, which has a flat-rate pricing structure, offers features to midsize users that MCI had previously made available only to large business customers. These options include consolidated billing and volume discounts based on spending by multiple locations.

Under MCI Vision, all calls made during peak hours — between 8 a.m. and 5 p.m. — cost 15 cents per minute when placed over dedicated access facilities and 20 cents per minute when switched access is used. Flat rates for international calls are tariffed on a per-country basis. Calls made during off-peak hours are discounted 20% off the flat per-minute rate.

MCI Vision supports features such as automatic ringdown and foreign exchange service, as well as the option of having billing invoices delivered on paper or magnetic media.

To simplify cost accounting, the company will offer MCI Vision customers a single invoice and reporting package that details calls and charges for domestic and international outbound and credit card calls from all company loca-

tions. Calls can be identified with codes assigned to employees, departments or calling cards, the company said.

Volume discounts, based on a company's combined usage from all locations and covering long-distance and credit card calls, can reach a maximum of 20% when monthly spending exceeds \$30,000. Discounts start at 5% for usage between \$1,000 and \$2,000.

Tim Price, vice-president of general business marketing at

\$100 per-month basic service charge for customers that sign up before October. But the \$25 monthly service fee for ringdown and personal identification codes will still apply.

Berge Ayvazian, vice-president of The Yankee Group, a Boston-based consultancy, said the value-added features of MCI Vision will be attractive to many customers.

Ayvazian said the package resembles business offerings from Telecom*USA, Inc., the long-distance company MCI is acquiring for \$1.25 billion. He added that the introduction of MCI Vision shows that MCI is developing market approaches to address Telecom*USA markets.

AT&T said it is prepared to counter the MCI Vision offer if demand warrants such a move.

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MCI, said MCI Vision's pricing is similar to the pricing for its existing Prism Plus and Prism I offerings. Complex rate structures are "old-fashioned," he said.

The company is not requiring customers to sign a contract for MCI Vision, and users can switch from MCI Vision at any time without penalty.

MCI said it plans to roll out an aggressive advertising campaign to promote the service. Also, it has hired 500 additional salespeople to handle MCI Vision accounts.

The carrier is waiving the \$100 installation charge and

But an MCI spokeswoman dismissed Ayvazian's conclusions. She emphasized that MCI Vision is a unique offering and that MCI had been working on the product's concept before MCI decided to buy Telecom*USA.

Gail McGovern, director of outbound services for AT&T, claimed that her company's Software-Defined Network service provides all of the features offered by MCI Vision. However, AT&T said it is prepared to counter the MCI Vision offer if demand warrants such a move.

US Sprint Communications Co. declined to comment. ■

Managers unite to conquer open systems problems

Group explores obstacles to deploying open systems, seeks union with existing organization.

By Wayne Eckerson
Senior Writer

Network and computing managers from some of the nation's largest companies have begun meeting informally to discuss ways to accelerate the development and implementation of open systems.

Dismayed by the slow progress of standards to date, the group is trying to develop a strategy for overcoming barriers to the adoption of open systems. In particular, the group wants vendors to be more attentive to user needs and less protective of their own vested interests in the open systems debate.

The group, which is unnamed, comprises between 70 and 100 managers with experience in integrating proprietary information systems. These managers represent companies such as E.I. du Pont de Nemours & Co., Eastman Kodak Co., General Motors Corp., Hughes Aircraft Co. and McDonnell Douglas Corp.

"Many users recognize that there is a need for a forum that defines common user requirements across multiple industries," said Bud Huber, manager of advanced networks integration at Hughes in Long Beach, Calif. Huber is serving as spokesman for the group.

"[Our group] doesn't want to write standards or specifications. We merely want to work with ven-

dors and standards groups to help them understand user requirements for open systems and implement them correctly," he said.

In February, 17 managers met in Atlanta, and in May, 30 met in Houston. The group is scheduled to meet in September in Detroit.

In its past meetings, the group defined a number of obstacles impeding the development of open systems, including cultural or political issues. Those matters range from a reluctance to change and fear of the unknown to lack of understanding and the need to protect vested interests.

Ideally, the group would like to join or merge with an existing open systems organization that can provide an appropriate forum for user interests and requirements, Huber said.

At the May meeting, the group identified the Corporation for Open Systems International (COS) as the organization best suited to meet user requirements. But the group stopped short of voting to join or merge with COS, Huber said.

Currently, the two groups are holding discussions on a number of issues, he said.

Besides COS, the group evaluated X/Open, the National Institute of Standards and Technology and CAM-I, a computer research and development think tank.

Despite its initial endorsement of COS, the group hasn't ruled out establishing itself as an official organization, although it is reluctant to do so, Huber said.

"There is a need for an organization that identifies user requirements and then works with vendors and standards organizations to implement them correctly, but forming another open systems group would probably be counterproductive," Huber said.

The group expressed reservations that COS is too narrowly focused on networking and communications.

According to the group, the ideal open systems organization would use the collective strength of its membership to get vendors to resolve their differences regarding open systems standards and architectures. It would also help educate vendors about user requirements and would work with international standards-setting and users groups, among others.

The group plans to issue a report sometime this summer that will discuss barriers to open systems and strategies for overcoming them.

For more information or to apply to attend the September meeting, call Gail Arnett at (313) 769-4454. ■

Southwestern Bell to unveil regional on-line directory

Will be first RBHC to offer the PC-accessible electronic service after winning FCC approval.

By Anita Taff
Washington Bureau Chief

ST. LOUIS — Southwestern Bell Telephone Co. last week received permission from the Federal Communications Commission to offer an electronic directory service that can be accessed by customers using personal computers.

The service, dubbed DirectLine Custom, is touted as a cost-saving and productivity tool for users that place more than 500 calls to directory assistance each month. The directory data base will reside on a computer here but may be accessed by users anywhere in the country.

DirectLine Custom will provide 15 million customer listings for the five states that are served by the carrier: Arkansas, Kansas, Missouri, Oklahoma and Texas.

Each listing includes the name, address and phone number of Southwestern Bell's business and residential customers. Unlisted numbers will not be available in the electronic data base.

The service can be accessed by any personal computer using standard communications software, according to Southwestern Bell.

This is the first time any RBHC has offered an electronic directory of all customers in its service area, claimed Sylvia Byrd, area manager for product management at Southwestern Bell. Other carriers have offered similar services that were available only to users in the same state, she said.

A quick fix

Byrd said the service will enable customers to obtain direct-

ry information faster than talking to an operator, particularly if the caller is unsure exactly how the person or business is listed. For example, with DirectLine Custom, callers will be able to quickly view all listings for a particular last name.

Byrd said the new service will also help companies cut costs. Directory assistance calls cost between 50 and 60 cents, depending on the long-distance carrier the customer chooses.

Charges for DirectLine Custom are a onetime establishment fee of \$4,152 and \$8.80 for one logon identification number. Additional ID numbers cost 30 cents each.

Customers will also be charged 9.3 cents for each screen of information they access. These charges do not include transport from the user site to the computer here.

Find America

AT&T has already announced that it will purchase Southwestern Bell's directory service, add transmission capabilities and sell the information through its AT&T Find America Directory Service.

An AT&T spokesman said that electronic access to directory service listings will take about one-tenth the time of a call to a directory service operator.

For the Find America Service, AT&T will charge customers a \$500-per-month subscription fee, \$100 for each ID number and a onetime \$500 site license fee for the personal computer software needed to access the service. On-line charges are \$22 per hour of connect time and 35 or 40 cents per screen.

Users dialing into AT&T over switched access facilities will pay the higher screen charge. These charges include transport costs.

AT&T has verbal agreements with the other six RBHCs and two independent local carriers to purchase and resell their directory services as soon as they are available.

Southwestern Bell must get approval from the FCC to sell the directory service to long-distance carriers. AT&T will offer the Find America Service under its Electronic Directory Assistance tariff, which was approved this month. ■

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

Microsoft Corp. plans to increase its work force by more than 50% in the next year, a company official said recently. The software firm expects to grow its work force from 5,200 employees to about 8,000 by July 1991, largely by hiring more software engineers.

DEC acquires 10% stake in StrataCom to fill mux void

DEC also gets say in fast packet development.

By Bob Brown
Senior Editor

MAYNARD, Mass. — Digital Equipment Corp. last week said it has purchased a 10% stake in StrataCom, Inc., a privately held maker of multiplexers based on fast packet technology.

The agreement is expected to give DEC significant influence in the development of StrataCom products as well as a reputable multiplexer offering to pitch to major accounts, analysts said.

Neither party would divulge the value of DEC's investment, although analysts estimated that the deal could be worth as much as \$10 million.

StrataCom's IPX multiplexer, which is based on fast packet technology, is likely to become the preferred T-1 multiplexer for DEC's mammoth internal communications network, which currently supports mainly Network Equipment Technologies, Inc. multiplexers in the U.S., according to Lee Sudan, DEC's director of enterprise networks.

"DEC and StrataCom have complementary technologies," Sudan said. He added that the IPX's ability to support voice, data and other types of traffic across wide-area networks would fill a void in DEC's product line.

Richard Moley, president and chief executive officer at StrataCom, which is based in Campbell, Calif., said the equity investment is a "ringing endorsement of our technology."

"DEC doesn't make many investments in other companies, so when it does, you know it's significant," he said.

The investment will strengthen existing business relationships between DEC and StrataCom, Sudan said.

Last year, the two companies
(continued on page 13)



StrataCom's Richard Moley

INDUSTRY BRIEFS

Andersen Consulting and Infonet Services Corp. last week said they have entered into a strategic alliance to offer outsourcing services.

Andersen Consulting and Infonet will team up to offer private, hybrid and virtual private networks, as well as computing services such as application processing, software development and data center management.

Andersen Consulting specializes in providing consulting and application development services, while Infonet is a worldwide value-added network provider.

The agreement will enable users to deal directly with either company.

According to Peter Cunningham, president of Input, a Mountain View, Calif.-based market research firm, "The combination of Andersen Consulting's integration and implementation capabilities with Infonet's network operations expertise and PTT partners could make this alliance a force to be reckoned with in the fast-growing outsourcing market."

Digital Equipment Corp. and Ernst & Young last week announced an alliance under which the two companies will work together to provide systems integration service to the health care industry.

The nonexclusive agreement calls for the two companies to supply complete systems integration packages that combine Ernst & Young's planning and design consulting expertise with DEC's computer and network products, and related systems
(continued on page 13)

Personal communications networks

FCC applications for trial PCN licenses — 1,850- to 1,990-MHz			
Company	Filed for license	Status	Request
American Personal Communications, Inc., Baltimore	May 3, 1990	Pending	To test PCN in the 1,850- to 1,990-MHz frequency band in Baltimore/Washington, D.C. area.
Graphic Scanning Corp., Englewood, N.J.	April 10, 1990	Pending	To test PCN in the 1,910- to 1,920-MHz frequency band in Chicago, Detroit area, Fairfield County, Conn., and White Plains, N.Y.
Litel Telecommunications Corp., Worthington, Ohio	May 30, 1990	Pending	To operate and test PCN in both the 2,400- to 2,483.5-MHz and 5,725- to 5,850-MHz frequency bands in Columbus, Ohio.
Motorola, Inc., Schaumburg, Ill.	June 6, 1990	Pending	To test PCN in the 1,850- to 1,990-MHz frequency band in Atlanta and Chicago.
PCN America, Inc., New York	Jan. 16, 1990	Granted May 8, 1990	Two-year license to operate a PCN facility in the 1,850- to 1,990-MHz frequency band in Houston and Orlando, Fla.

GRAPHIC BY SUSAN J. CHAMPNEY SOURCE: FEDERAL COMMUNICATIONS COMMISSION, WASHINGTON, D.C.

PCN firms grapple with bandwidth issue

Lack of radio frequencies forces firms to trial shared bandwidth setups to reach market faster.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — Personal communications networks (PCN) may well represent a new telecommunications frontier, but pioneering suppliers must overcome a sizable hurdle before they can begin to offer services.

Due to a scarcity of usable radio frequencies, the Federal Communications Commission — which has the authority to license PCN service providers to operate within a specific frequency range — is allowing PCN companies to piggyback their services onto radio frequencies already used for microwave transmissions and other technologies.

If these trials prove successful, they could speed the introduction of PCN services.

If frequency sharing fails, however, the FCC will be forced to enter into the time-consuming process of reallocating radio frequencies.

That process would involve taking radio frequencies from some users and service providers in order to reserve bandwidth for these new services, a process that could significantly delay the roll-out of PCNs.

Andrew Lipman, a partner in the Washington, D.C. law firm Swidler & Berlin, told attendees at a recent PCN conference here that "spectrum allocation has always been the regulatory equivalent of [the old West's] range wars in the U.S."

Benefits to users

Although definitions for PCNs vary widely, most PCN companies agree that users would be able to employ portable wallet-sized

handsets to dial other PCN handsets or to route a call over the public switched network.

When a user places a call, the handset would radio the transmission to a honeycomb of radio base stations that could be deployed throughout buildings, cities and across the country. These base stations, which are based on microcell radio technology, act as switches and pass calls across the network.

For corporate users, the technology has implications beyond just offering a portable communications system. Many industry

“Spectrum allocation has been the equivalent of [the old West's] range wars.”

▲▲▲

observers expect PCNs will become an effective alternative to local telephone company service.

"PCNs will clearly bring competition to the local loop," said Henry Rivera, a partner in the Washington, D.C. law firm of Ginsberg, Feldman & Bress.

Unlike current bypass carriers that have installed bypass routes in major metropolitan areas, PCN service suppliers would have more flexibility to deploy their service on a much wider basis.

Eric Ensor, director of worldwide wireless strategy development at BellSouth Enterprises,
(continued on page 11)

People & Positions

Kathy Graham recently joined **Ungermann-Bass, Inc.**, a Santa Clara, Calif.-based network equipment vendor, as director of the newly established Channels Marketing Organization.

Graham will be responsible for developing the firm's worldwide distribution channels, which include carriers, value-added resellers, local-area network systems integrators and distributors. Previously, Graham was vice-president of sales and marketing for Network Research Corp. in Oxnard, Calif.

Ungermann-Bass also recently promoted **Roger Bertman** to vice-president of marketing for networking.

Bertman is charged with developing and implementing Ungermann-Bass' worldwide marketing programs, including corporate positioning, product direction, marketing communications and channels strategy. Previously, Bertman was director of marketing.

Datability Software Systems, Inc., a New York-based maker of network software, recently named **Jim Gallagher** to the newly created position of vice-president of North American sales.

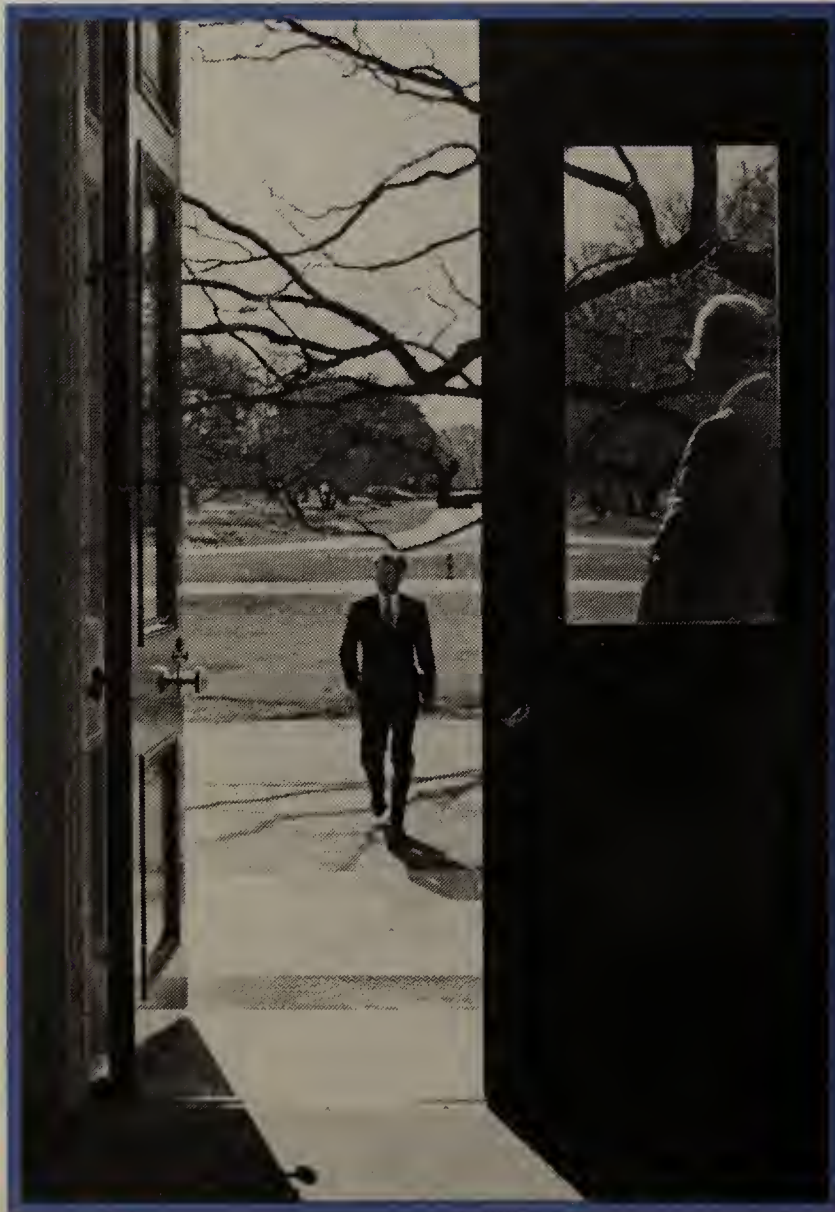
Gallagher will be responsible for the creation and growth of Datability's value-added reseller distribution system for its VISTA Communications Platform. Gallagher was previously national sales manager at Datability. ■

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Novell certifies Unisys to provide technical support for NetWare

By Bob Brown
Senior Editor

BLUE BELL, Pa. — Unisys Corp. recently said it will provide technical support to users of Novell, Inc.'s NetWare network operating system under terms of two new agreements between the firms.

Novell has certified Unisys as an authorized NetWare Support Organization (NSO), which enables the vendor to provide both on-site technical support and telephone assistance to NetWare users worldwide.

As an authorized NSO, Unisys can provide 24-hour support to NetWare customers, including on-site repairs and a hotline to answer customer questions. Unisys, one of Novell's largest NetWare resellers, will provide the service to customers whether or not they own Unisys products.

Unisys also can now hook into Novell's problem resolution and product information data bases.

In addition, Novell appointed Unisys a Novell Authorized Education Center. This allows Unisys to provide Novell Certified Network Engineer training to its service technicians and engineers, which assures

users that Unisys technicians are qualified to work on NetWare nets.

The Unisys agreements fit well with Novell's strategy to hand off service responsibilities to resellers and distributors, said Chad Allred, director of service marketing at Novell. Xerox Corp. also provides nationwide service and support to NetWare users.

Novell certified Unisys as an authorized NSO.

▲▲▲

The agreements will bolster Unisys' recently unveiled strategy, dubbed Connect, to become a single-source provider of services to local-area network users. Under the Connect program, Unisys provides personal computer LAN users with planning, design, implementation, maintenance and support services for their multivendor networks. □

PCN firms grapple with bandwidth issue

continued from page 9

Inc., a unit of BellSouth Corp., admitted that the carrier is concerned about local-loop competition from PCNs but that competition could also provide the company with additional revenue opportunities.

"We hope it won't go away. We think PCNs offer some pretty interesting services, and we expect to be doing some trial work on this issue," he said.

Trials on horizon

A handful of companies are awaiting FCC approval to test PCNs over the radio frequencies already used by other services. These companies, including Litel Telecommunications Corp. and Motorola, Inc. have plans to test PCNs in major cities, such as Atlanta, Chicago, New York and Washington, D.C. (see graphic, page 9).

To date, the FCC has only granted one license for a PCN trial above 1.7 GHz — that going to PCN America, Inc. The trial calls for the company to test its service in the 1.85- to 1.99-MHz range.

Fred Thomas, an engineer with the FCC's Frequency Allocation Branch, pointed out that PCN providers will be competing with private microwave licensees in the 1.85- to 1.99-MHz bands, broadcast auxiliary bands in the 1.99- to 2.1-MHz range, and common carriers employing microwave transmission in the 2.11-MHz and up range.

PCN America contends that the 1.7- to 2.3-GHz range is best suited for PCN applications.

The FCC has also granted testing licenses to five other companies to test systems in the 866- to 941-MHz range. However, these services are largely based on digital cellular radio transmission technology, called CT/2, developed in England, unlike other trials based on advanced microcell technology developed in the U.S.

American Personal Communications,

Inc., Cellular General, Inc., Cellular 21, Inc. and Matrix Personal Communications, Inc. are testing systems in the lower frequency range.

Eric Schimmel, vice-president of the Telecommunications Industry Association, which represents about 500 equipment manufacturers, said there is yet no clear quality or functional distinction between the lower and upper ends of the spectrum where PCN tests are being performed. Schimmel noted that PCN competitors could emerge from both ends.

The FCC, PCN suppliers and users are looking to PCN America's trial — which is expected to begin later this year — to establish whether a PCN service can share the same bandwidth with microwave systems.

If the PCN America tests in Houston and Orlando, Fla., disturb private microwave networks operated by the oil and utility companies in those cities, the PCN trials will be shut down immediately, said the FCC's Thomas.

Should spectrum sharing not prove to be a feasible option, Thomas said, the issue of spectrum reallocation will have to be squarely faced. An effort is already under way in Congress to free up a block of bandwidth between 1.71 MHz and 1.85 MHz, which is typically reserved for government and military use.

Rep. John Dingell (D-Mich.) introduced a bill called "The Emerging Telecommunications Technologies Act of 1990." If passed, the bill would create a private sector advisory committee of manufacturers, commercial carriers, users, the FCC and industry experts that would decide how to reallocate the government bandwidth to the private sector.

Just last week, the bill was moved from a House Committee on Energy and Commerce to the House floor for comment.

"This is an important piece of legislation; it will have a profound impact on manufacturers and services providers," Dingell said. □

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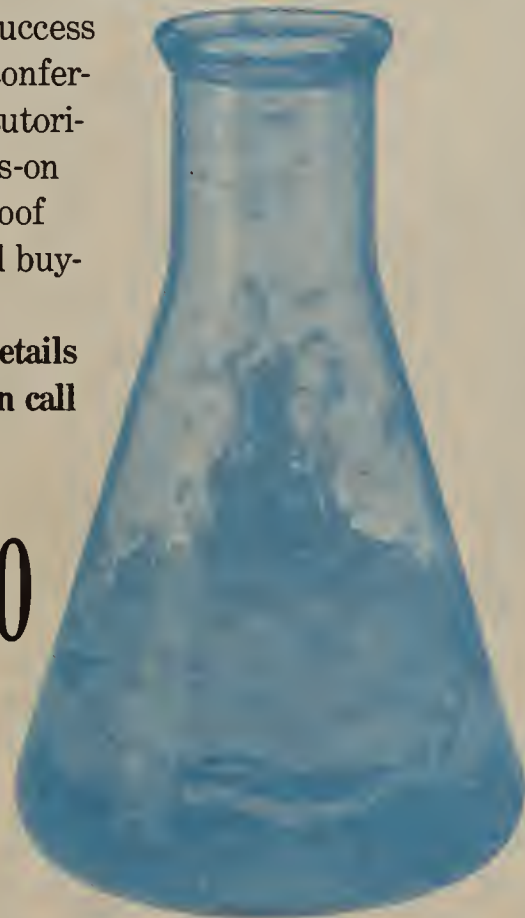
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DEC acquires 10% stake in StrataCom

continued from page 9

signed a joint marketing agreement to reference each other's products in customer accounts. Both companies also agreed to develop products using frame relay technology.

DEC and StrataCom first began working together in September 1988 when StrataCom became one of the seven original supporters of DEC's Network Enterprise Management Strategic Vendor Program, Sudan said.

Benefits to both

Tim Zerbiec, a principal at Vertical Systems Group in Dedham, Mass., said DEC's investment in StrataCom will help ensure that both companies continue to develop products that can interoperate.

"StrataCom's fast packet switching products are well suited to support the bursty, nondeterministic traffic [that is] common in DEC workstation environments, such as LANs," Zerbiec said. "By making this investment, DEC will have

"It takes StrataCom further along the legitimacy trail," he said.

On the other hand, StrataCom could be giving up too much control over its future by aligning with DEC and Motorola, both of which will want substantive input in future StrataCom products and technology.

There could be some concern on the part of Motorola, which resells StrataCom's switches via its Codex Corp. subsidiary, that StrataCom will rely more on DEC for input into product direction, Hecht said.

A Codex spokesman, however, said Codex welcomes the investment by DEC in that it further stabilizes StrataCom and lessens the burden on Codex to fund future StrataCom research and development efforts. **■**

Industry Briefs

continued from page 9

integration services.

DEC has announced systems integration agreements with several other consulting firms, including Deloitte Haskins & Sells Co. and Arthur D. Little, Inc.

Nynex Corp. and Coordination Technology, Inc. (CTI) last week announced that they have formed an alliance designed to integrate Nynex's broadband data communications technologies with CTI's groupware software offerings.

Specifically, the two firms plan to integrate Nynex's Switched Multimegabit Data Service offering, a service supporting speeds up to 45M bit/sec, with Trumbull,

Conn.-based CTI's Together software. The Together software enables personal computer users to coordinate their work over a network.

Such an integration would enable Together users "to work concurrently on projects over large geographical areas," said Kate Devine, staff manager of marketing and planning at Nynex.

The high-bandwidth transmission service would make it possible to support applications such as image transfers.

The planned service is currently being tested at Nynex's Science and Technology Center.

The companies are examining the technical specifications and requirements needed to make their offerings compatible. **■**



DEC's Lee Sudan

more leverage in dictating features for future StrataCom products."

A closer relationship with StrataCom should help both DEC and StrataCom in Europe, said Howard Hecht, program director for the enterprise network strategies service at Gartner Group, Inc., a Stamford, Conn.-based market research firm.

"DEC needed a strong mux offering in Europe," Hecht said. "That's a fertile market where you don't have IBM selling heavily."

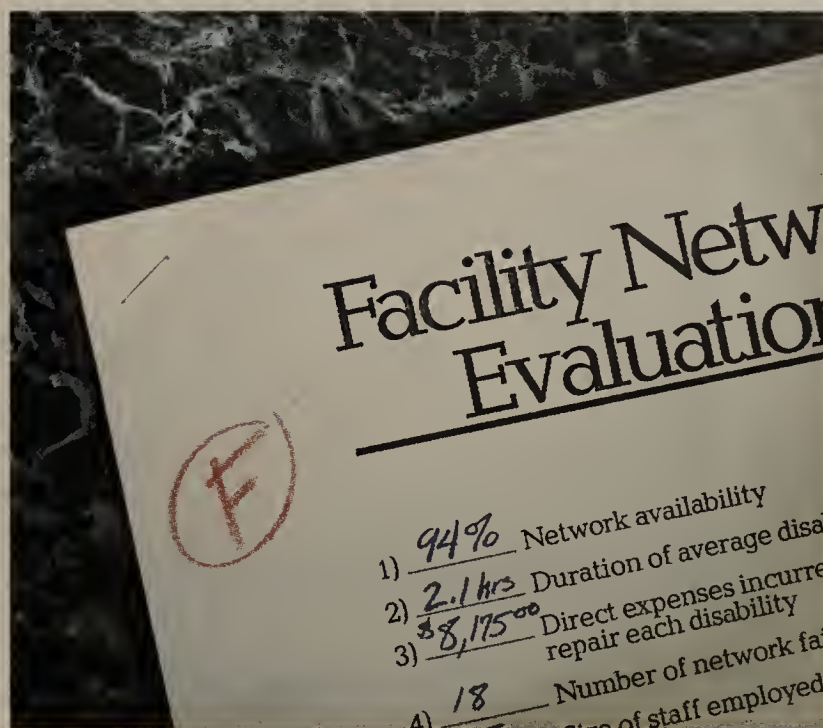
DEC, which already has strong sales of its own products in Europe, should be able to help StrataCom certify its products with various European telecommunications administrations, Hecht said.

StrataCom's Moley added that the investment helps his company because it will not "need to rush in and evolve our sales and support structure outside of the U.S. on our own. We can focus our investment in growing our presence in the U.S. and developing more products."

Analysts also applauded the agreement in that it further stabilizes StrataCom financially. Motorola, Inc. already owns a 20% stake in StrataCom.

Financial stability could be particularly important in light of StrataCom's desire to go public, which will probably be within a year, Hecht said.

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Worth Noting

Days Inns of America, Inc. is training the homeless, the handicapped and senior citizens to serve as telecommunications agents at its Atlanta and Knoxville, Tenn., reservation centers. Days Inns temporarily houses the homeless in its hotels.

Carrier Watch

Southern New England Telephone Co. (SNET) last week was granted permission from Connecticut's Department of Public Utility Control to begin offering high-end WATS and 800 services to large businesses.

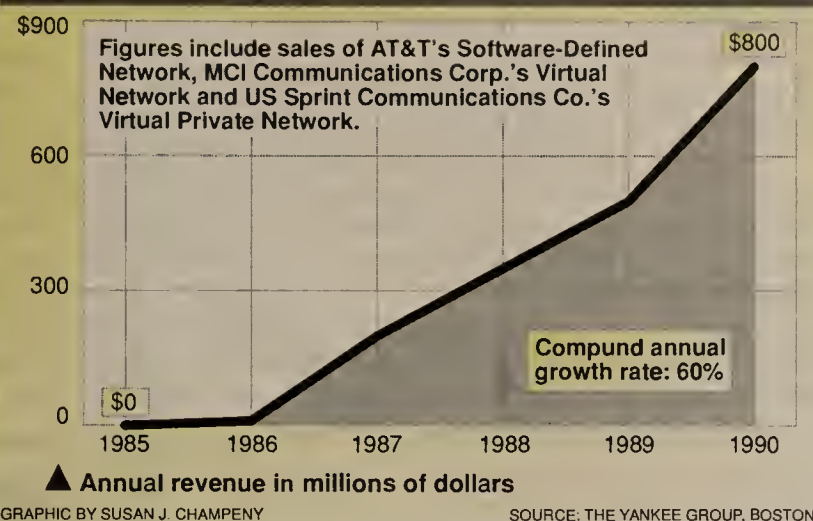
Regulators opened up the state's large business telecommunications market to competition in April and allowed **AT&T** to offer intrastate WATS service. Early last week, the department approved a request by **MCI Communications Corp.** to enter the market. A preliminary decision on **US Sprint Communications Co.**'s application is expected in July.

SNET's new services are Premium WATS, which is designed for users with more than 300 hours a month of usage on current SNET WATS service, and Premium 800, which is targeted at companies that use current 800 services more than 350 hours per month.

Schneider Communications, a Green Bay, Wis.-based carrier, recently acquired **Great Lakes Tel-Touch Long Distance Service**, which provides long-distance service to businesses in Michigan's Dickinson and Iron counties.

Great Lakes Tel-Touch's customers will now be able to use Schneider's 800, international calling card, voice mail, and analog and digital private-line services. ■

Virtual network revenues climb



AT&T, C&P settle dispute, share in Treasury net deal

C&P will be primary subcontractor on project.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — The U.S. Department of the Treasury recently awarded AT&T an eight-year, \$90 million contract for the agency's long-disputed Digital Telecommunications Switching (DTS) network.

The DTS network, which will be supported by as many as 44,000 Integrated Services Digital Network lines, will link Treasury Department offices in the Washington, D.C. area.

A deal worked out between the two competitors for the contract — AT&T and The Chesapeake and Potomac Telephone Co. (C&P) — ensures that the four-year battle for the DTS award is finally over. AT&T signed C&P to serve as primary subcontractor for the project. In return, C&P has agreed not to protest the contract award to the General Services Administration Board of Appeals.

The Treasury Department has awarded the contract to AT&T twice before. But in 1988 and again in 1989, C&P protests forced the GSA to open the contract for rebidding. C&P had argued that the ISDN handsets specified in AT&T's bid were not commercially available products, a requirement of the contract.

AT&T has since submitted satisfactory certification for its handsets, according to the Treasury Department procurement officer.

The former rivals expressed satisfaction about their partnership. "We took the clear business course to team up with AT&T for the contract," said a spokesman for Bell Atlantic Corp., parent company of C&P. "It was prudent. It made sense to stop the litigation."

An AT&T spokesman con-

firmed the carrier had talks with C&P. But he pointed out that AT&T had initiated discussions on teaming up several times with C&P during the procurement's stormy past.

According to Dennis Smith, AT&T's national marketing manager, "We reached a point where we decided it was in the best interest of the Department of the Treasury to reach a middle ground. We decided we'd be more effective with each other than against each other."

C&P may have lost its zeal for DTS-related legal protests after a run-in with the Treasury Department. In April, the department suspended Bell Atlantic from all federal bidding after accusing C&P of fraud.

The agency said the C&P DTS bid was fraudulent because equipment it included in the bid was not commercially available. Again, ISDN handsets were the issue. Bell Atlantic discovered it had given a wrong version number for the Northern Telecom, Inc. handsets it had specified in its bid. The Treasury Department accepted the explanation and lifted the suspension in May.

The department awarded AT&T the DTS contract based on technical superiority, said Bud Pratsch, the agency's procurement officer.

It will take 18 months to cut over to DTS, which will use an AT&T 5ESS switch to support agencies such as the Internal Revenue Service, the Secret Service, the Customs Service and the U.S. Mint. "It's a 5ESS being used as a PBX," Smith said.

C&P will provide operations and maintenance support for the life of the contract. Also on the AT&T team are Institutional Communications Corp. (ICC), a

(continued on page 16)

Despite good marks, RBHC service slips

Users give generally good report card to RBHCs; however, small service slips may indicate trend.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Although users seem generally satisfied with services purchased from the regional Bell holding companies, a report issued recently by the FCC shows a growing incidence of the carriers missing promised service delivery dates.

The Federal Communications Commission compiles reports twice each year examining how well the RBHCs are doing in five areas: overall customer satisfaction, time to receive dial tone, transmission quality, on-time service orders and call blocking. The reports are based on data provided by the RBHCs from internal user surveys.

According to the report, overall satisfaction among large business users has fallen slightly. At the end of 1989, 93.8% of users said that, overall, they were satisfied with RBHC performance, compared with 94.6% in 1988.

Customer satisfaction scores for individual companies ranged from a low of 89% for US West, Inc. to a high of 96% for Bell Atlantic Corp. The FCC report does not give specific reasons why cus-

tomers reported dissatisfaction with their carrier.

Scores for on-time delivery of services also declined. The report breaks down service delivery into three categories: residential, access and business. In all three categories, the RBHCs failed to meet promised delivery dates more often during the second half of 1989 than in the first half.

Services were delivered to business users on time in 98.3% of the cases, down from 98.9% in the first half of the year. In the first half of 1988, RBHCs met their deadlines 98.6% of the time, compared with 98.9% for the second half of 1988.

User scores in dial-tone delivery, transmission quality and call blockage remained fairly constant during 1988 and 1989.

Although the service level drops reported for 1989 may seem small, they could indicate gradual deterioration of service quality, said Jonathan Kraushaar, an electronic engineer in the FCC's Industry and Analysis Division and author of the report.

"Small fluctuations may not have any clear significance, but continuing small declines could

(continued on page 16)

WASHINGTON UPDATE

BY ANITA TAFF

Sikes expresses concern over ruling. The telecommunications industry was given a clue last week of just how concerned the Federal Communications Commission is about the federal appeals court's recent decision to overturn its Computer Inquiry III ruling. At one of his first public appearances since the ruling, FCC Chairman Alfred Sikes revamped his speech to deal almost exclusively with the possible impact of the court's decision.

In an address to the Mid-America Regulatory Conference, Sikes said the appeals court ruling "potentially places initiatives such as Open Network Architecture and enhanced service provider deregulation at some real — or at least broadly perceived — risk." Sikes went on to say that the ruling couldn't have come at a worse time. He pointed out that only two months earlier, the FCC had given the final go-ahead to the regional Bell holding companies to implement their ONA plans.

Sikes also said he was upset that the ruling came out just as Congress was to consider legislation that would free the RBHCs from some Consent Decree restrictions and move oversight responsibilities from the U.S. District Court for the District of Columbia to the FCC. If the appeals court ruling stands and the RBHCs are required to offer their enhanced services through separate subsidiaries, Sikes said the cost of rolling out new services will go up and the RBHCs may be limited in the number of new services they can offer. ■

Mobil awards pay telephone contract to MCI

By Anita Taff
Washington Bureau Chief

NEW YORK — Mobil Corp., the nation's second largest petroleum company, has chosen MCI Communications Corp. to handle pay phone traffic from the company's 12,000 service stations nationwide.

An MCI spokeswoman said Mobil has agreed to hand over pay phone traffic from its 1,000 corporate-owned stations and to

work with owners of about 11,000 independent stations to assign traffic to MCI. Owners of the stations will receive a commission from MCI for routing traffic to the carrier.

The contract is worth an estimated \$10 million to \$36 million, depending on how many independent stations choose MCI, the spokeswoman said. So far, about 5,000 independent stations have agreed to use MCI. AT&T had previously carried Mobil's pay phone traffic.

MCI has been vigorously competing for pay phone traffic since U.S. District Court Judge Harold Greene issued a ruling in October 1988 that banned the regional Bell holding companies from automatically routing pay phone traffic to AT&T. Owners of premises where pay phones are located

can now choose which carrier will handle pay phone traffic. Callers can reach other carriers by dialing an access code.

In May, MCI won a five-year contract that could be worth up to \$375 million to carry pay phone traffic from 75 U.S. Navy bases in the U.S. and Puerto Rico. This is one of the largest contracts MCI has won for any service.

Corporations are just now becoming aware that pay phone services can be highly profitable, said Nathan Kantor, president of MCI's Northeast Division. Until now, most companies viewed pay phones only as a customer service, according to MCI.

A spokeswoman for Mobil downplayed that aspect of the pay phone deal, saying the company was primarily interested in

providing a good customer service. "The retail gasoline business is extremely competitive, and what we're looking for is another service for our customers," she said.

She said the company decided to evaluate other carriers because its contract with AT&T was expiring. "This time around, it was MCI; next year, who can say?" the spokeswoman said.

MCI was chosen primarily because of its service quality, both in transmission and in servicing accounts. The Mobil staffer responsible for making the selection conducted an informal test of pay phones using different carriers' calling cards to see which one provided the best response, the spokeswoman said. Also, Mobil uses other MCI offerings and was pleased with its service. □

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Despite RBHCs' good marks, service slips

continued from page 15

serve as an alert to adverse trends," he said. Information on how many users the RBHCs surveyed was not available.

Frank Dzubeck, president of Communications Network Architects, Inc., a consulting firm in Washington, D.C., said he was surprised that the FCC report showed an increase in missed deadlines by the RBHCs. Based on his experience helping clients install nets, Dzubeck said, "it is a rare exception that you don't get service on time."

The FCC reports were begun in 1983 to monitor the effect of divestiture on quality of service. Rather than trying to single out problems with any one company, however, the FCC examines aggregated data from all seven companies to key in on trends.

One weakness of using aggregated data is that it tends to mask severe individual service declines, such as those caused by natural disasters or fires, Kraushaar said.

For example, many of the RBHCs have not reported how strikes during the second half of 1989 affected service performance.

Kraushaar also warns that the report's conclusions should be viewed with caution since the RBHCs use different methods to calculate results and may change performance standards over time. □

AT&T, C&P settle dispute, share deal

continued from page 15

McLean, Va.-based bypass carrier, and Cincinnati Bell Information Systems, Inc. (CBIS). ICC will provide private-line links to the 5ESS. CBIS will provide its ICE-9 software package for billing and network reports. C&P will perform operations, administrative and maintenance support.

Smith noted that the Treasury Department had not specified an ISDN network in its request for proposal but AT&T felt that "to offer them anything less than ISDN would be wasting their time" since the network will be in service for many years.

The network will support an unspecified number of remote 5ESS modules at 17 locations, and the Basic Rate Interface (BRI) will be used to connect 20,000-plus stations. The 5ESS switch supports both BRI and the Primary Rate Interface.

The AT&T/C&P accord will smooth the transition from the department's current network, AT&T said. C&P has provided the Treasury Department's private net since 1976. As the incumbent, it will be playing an important role in the cutover. □

Introducing the telecommunications management report so advanced

Description of Charges and Services by Location

Summary of Charges Across All Locations

Summary of Services Across All Locations

First Financial
One Park Avenue
Chicago, IL 60611

Reporting period: Jan 90
Page no: 1

Service	Number of lines/codes	Number of locations using service	Minutes this period		Total minutes this period	Recurring charges and credits	Average rate per minute*	
			Domestic	International			This period	1 and 3 periods
MCI Card	63	34	8,249.0	0.0	8,249.0	\$2,630.82	\$0.2461	\$0.1958
PRISM PLUS	98	2	25,553.0	44.9	25,597.9	3,780.42	0.1561	0.1888
MCI 800	6	2	58,716.2	234.7	58,950.9	8,476.12	0.1312	0.1345
VNET	29	1	213.7	15.0	228.7	213.67	0.2093	0.2101
MCHMax	10	4	0.0	0.0	0.0	25,238.84		
Private Line	0	46	134,873.3	735.6	135,608.9	\$45,458.69		
Total	206	46						

Service	Recurring charges and credits		Service, feature and equipment charges	Net end-time charges	Directory assistance	Taxes and surcharges	Total charges
	Total usage	Usage discounts					
MCI Card	\$2,675.30	\$44.48	\$0.00	\$207.54	\$18.94	\$82.52	\$1,924.74
PRISM PLUS	8,356.86	1874.65	0.00	30.00	402.05	\$29.17	6,443.23
MCI 800	3,780.42	273.73	244.44	256.10	0.00	253.03	4,460.26
VNET	6,888.95	612.83	0.00	400.00	0.00	187.49	7,063.61
MCHMax	218.54	5.87	0.00	0.00	0.00	8.58	222.23
Private Line	0.00	0.00	25,238.84	5686.10	\$412.46	\$420.99	\$1,568.72
Total	\$27,100.87	\$2,811.56	\$25,483.78	\$686.10	\$412.46	\$420.99	\$47,860.66

*The average rate includes discounted domestic calls, other than directory assistance. Recurring access charges and service fees are also included.

Report date: 02/17/90
Customer no.: 310
Trade no.: 46
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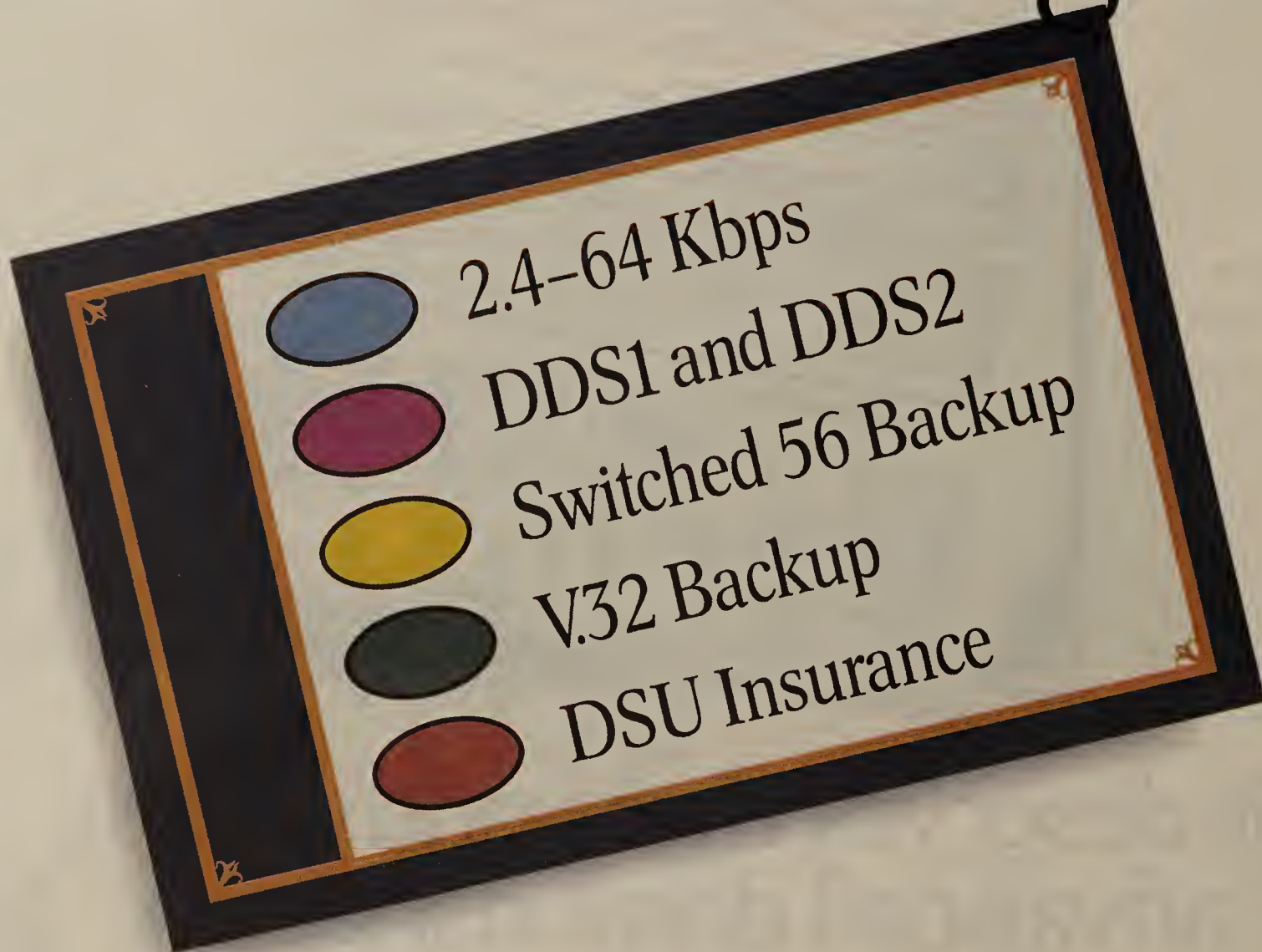
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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

“The network is becoming all-important, and the devices connected to it are becoming subservient.”

Janice Carter

Director of corporate telecommunications
Nordstrom, Inc.
Speaking at the recent
International Communications
Association conference
in New Orleans

Data Packets

Bytex Corp. last week announced a short-haul time-division multiplexer that will enable users to link as many as 32 terminals directly to a host or to a Bytex Unity matrix switch located as far as 3,500 feet away.

Called the **Cable Manager**, the product supports as many as four interface boards, each of which has eight RS-232 or V.35 ports that support asynchronous data at up to 19.2K bit/sec or synchronous data at up to 80K bit/sec. The Cable Manager multiplexes data from terminals for transmission over a single 4.6M bit/sec link to another Cable Manager in front of the host or matrix switch.

The receiving unit demultiplexes incoming signals into individual lines that are then connected to ports on the host or matrix switch.

By contrast, other products connect a composite link directly to a single host or matrix switch port.

Cable Manager eliminates the need for multiple point-to-point line drivers and short-haul modems.

The product is controlled from an ASCII terminal that is linked to the unit via an RS-232 port.

The base Cable Manager unit includes a chassis, power supply and logic board, and it is priced at \$2,995. Users must add port boards, which cost \$995 each for RS-232 interfaces and \$1,560 each for V.35. ■

GEIS hopes to lure hotels to reservation net service

Service would let hotels farm out net operations.

By Barton Crockett
Senior Editor

ROCKVILLE, Md. — GE Information Services (GEIS) recently introduced a network-based reservation service aimed at convincing hotels to outsource reservation operations to a vendor, rather than manage the operations themselves.

The service, called Managing On-Line Reservations (MANOR), is targeted at midsize and large hotel chains looking to upgrade the computer systems they use to process reservations.

MANOR uses GEIS' worldwide value-added network (VAN) to carry reservation information to and from hotel-operated reservation centers, the GEIS host computers that track room availability on behalf of hotels and the hotels where travelers actually stay.

The service will compete with similar hotel reservation offerings from J.C. Penney Co., Inc., AMR Travel Related Services, Co-via Partnership and London-based Reed International PLC.

“With the growth of the airline megasystems, automation has become more important in the travel industry,” said Larry Chervenak, president of New York-based consultancy Chervenak, Keane & Co. “As the market's gotten hotter, these kind of [out-

sourcing] services have cropped up as an alternative to a hotel putting in its own system.”

In a MANOR implementation, GEIS will install Novell, Inc. NetWare local-area networks using IBM Personal System/2 microcomputers in a hotel's reservation centers.

Each of the PS/2s on the LAN will also be connected to a local packet assembler/disassembler which, in turn, will be linked to a local node of the GEIS VAN, typically via a dedicated 9.6K bit/sec circuit.

Full data bases of hotel locations, rooms offered and such attributes as the kind of view afforded and proximity to museums will be maintained on each PS/2 used by reservation agents. Actual room availability will be tracked on GEIS-operated host computers in Amsterdam, the Netherlands, and Cleveland that reservation agents will access via the GEIS international VAN.

When potential customers call in, reservation agents will be able to tap into the data bases on their PS/2s to pull up descriptions of the kinds of rooms offered by the hotel chain. When a customer requests a room, reservation agents will use their PS/2 to send out an inquiry over the network to the GEIS host processors.

(continued on page 20)

User, VSAT firm concoct unusual shared hub deal

By Jim Brown
Senior Editor

DALLAS — Trinity Industries, Inc. recently struck an agreement with Racal-Milgo SkyNetworks that could help it significantly lower the cost of operating a new VSAT network.

Trinity, a manufacturer of railroad cars and other fabricated metal products, said it will permit Racal-Milgo to build a shared very small aperture terminal hub on company property adjacent to its headquarters here. This will enable Racal-Milgo to begin offering VSAT services in the Dallas area without having to acquire its own site.

In return, Racal-Milgo will pay Trinity a flat monthly fee for other users' sites that are supported by the hub.

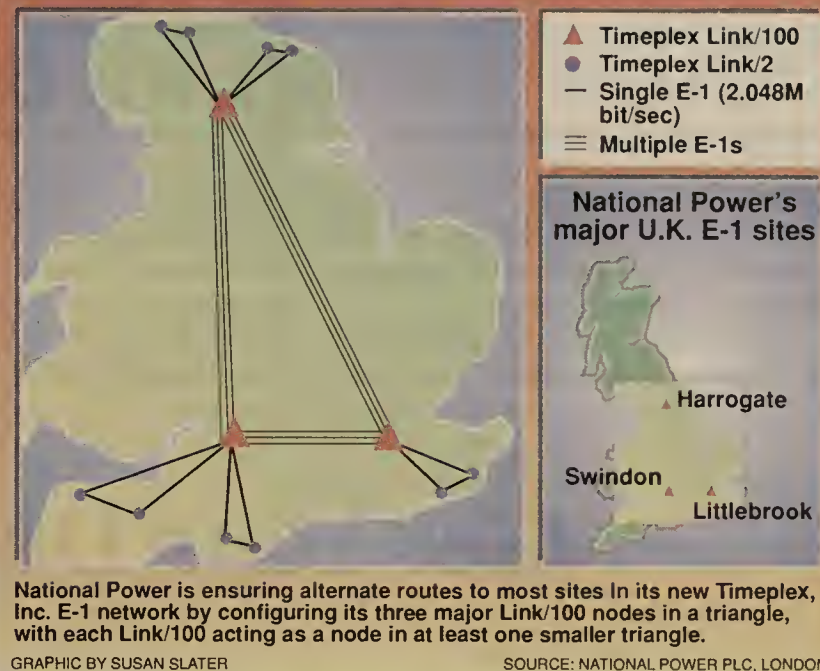
This will help Trinity defray the monthly cost of operating a 35-node VSAT network it is build-

ing to link terminals and printers at remote plants to IBM Application System/400, Digital Equipment Corp. VAX and Hewlett-Packard Co. HP 3000 minicomputers in a data center here. Last month, Trinity awarded Racal-Milgo a \$1.1 million contract to build the network.

“There is the distinct possibility of us getting a free network in the end,” said Ed VanPetten, Trinity's director of corporate data processing. According to traffic projections, VanPetten said the shared hub would need to support a total of at least 400 remote sites owned by other users in order for Trinity to obtain free service.

Racal-Milgo has similar arrangements with five other users for shared hubs. Those hubs are located in Columbus, Ohio, Charlotte, N.C., Greenville, N.C., (continued on page 20)

Triangulating alternate routing



U.K. power company builds giant E-1 net

National Power will install 150 E-1 lines in mesh setup to support voice, video, DECnet, SNA data.

By Paul Desmond
Senior Editor

LONDON — National Power PLC is spending over \$13 million on a new E-1 network that will support DECnet and Systems Network Architecture traffic, along with voice and video communications.

National Power, one of four companies created by the March divestiture of the U.K.'s Central Electricity Generating Board (CEGB), is building its own telecommunications network to replace the CEGB net it now shares with the other three rival utilities.

The network will be used to support voice, as well as two new data networks, which will replace the collection of eight data nets used by CEGB.

“The company's effectively been torn limb from limb in the breakup,” said Chris Yates, corporate telecommunications manager for National Power. “It's a case of survival.”

The company's new mesh-design E-1 (2.048M bit/sec) network, to be completed by year end, will be based on six Timeplex, Inc. Link/100 multiplexers and 75 smaller Link/2 multiplexers.

Worth a total of \$5.4 million, the multiplexers will switch about 150 E-1 circuits leased from British Telecommunications PLC and Mercury Communications, Ltd. National Power has signed contracts with those carriers worth a total of more than \$8.5 million.

Two Link/100s will be installed in each of three main switching centers in England: the principal new data center under

construction in Harrogate, a plant in Littlebrook near the headquarters here, and an office building in Swindon.

Each node in that triangle will support E-1 lines to Link/2s located at various power plants and business offices.

For the most part, the network is configured so that two Link/2 sites form a triangle in combination with a Link/100 node (see graphic). That complements the Link multiplexers' ability to route

The network will be based on six Link/100 multiplexers and 75 Link/2 multiplexers.

▲▲▲

around failed nodes or links, Yates said.

To help configure and manage the net, National Power will use Timeplex's TimeView/2000 net management system, which will give the company the ability to monitor, diagnose and configure each network node from a central site.

Once the E-1 network is in place, it will support two new data nets that National Power is constructing. The data networks are expected to alleviate confusion brought about by CEGB's previous network strategy.

Over the years, CEGB gradual- (continued on page 20)

User, VSAT firm concoct hub deal

continued from page 19

Omaha, Neb., and Syracuse, N.Y.

In addition to providing Racal-Milgo with a site for its shared hub, Trinity will also provide electrical power needed to operate the facility. Racal-Milgo will operate the hub.

Avoiding the telephone company

Trinity opted for VSAT technology as a cost-effective way to reach plants located in remote areas. VanPetten said the firm examined T-1 and fractional T-1 services, but found them too expensive.

"You always pay premium prices to the telephone company in order to go to re-

remote areas," VanPetten said. In fact, VanPetten projects the VSAT net will cost at least 50% less than leased lines and will become even cheaper when Trinity starts collecting monthly checks from Racal-Milgo.

Trinity could have contracted with another VSAT vendor that operates a shared hub in the nearby Dallas-Fort Worth Teleport. But the deciding factors were the fees it will get for providing the land for the shared hub and VanPetten's belief that Trinity can obtain exceptional service from Racal-Milgo SkyNetworks in exchange for a good reference.

"We're the first user of their service here in town," VanPetten said. "So we're the one reference they have to give out. And if they are not performing well, we have a whole lot of leverage." □

GEIS to lure hotels to reservation service

continued from page 19

The hosts will inform reservation agents if the requested rooms are available. In the event a desired room is already booked, the host will suggest alternative rooms that could be reserved. Once a reservation is made, reservation agents key the relevant data into their PS/2s and a message is sent to the GEIS host updating the master list of available rooms. The hosts also will send messages via the VAN to the hotel where a guest will stay. These messages can be sent via network links to local processors on a hotel's premises, or they can be sent via facsimile or telex.

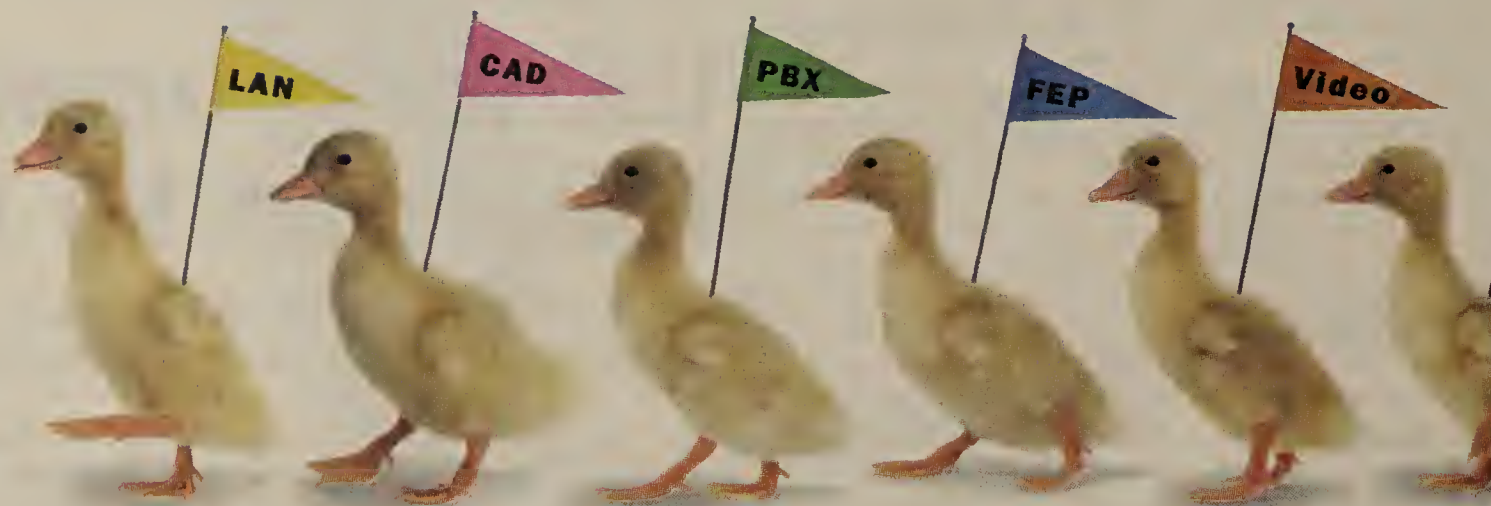
The GEIS hosts will also maintain net-

work links with various airline travel reservation systems, including the SABRE network operated by AMR Corp., the parent of American Airlines, Inc.; the Apollo network operated by a consortium of airlines including United Air Lines, Inc.; System-One, which was acquired by Electronic Data Systems, Inc. from Texas Air Corp.; and the Amadeus network being built by a consortium of European airlines.

These links will enable travel agents using those airline reservation networks to book reservations with hotel chains subscribing to GEIS' MANOR service.

Barry Clarke, manager of sales development in GEIS' London office, said that GEIS will charge, on average, a onetime fee of \$150,000 to set up and operate MANOR on behalf of a hotel, plus a maximum of \$3 per transaction. He said a recent GEIS survey of leading hotel chains in Europe and the U.S. found that more than half are planning to upgrade their reservation systems over the next four years. □

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See The FAXNet Form on Page #40

U.K. power company builds giant E-1 net

continued from page 19

ly added different computing architectures. Today, the firms formed by CEGB's breakup are saddled with eight distinct data nets, Yates said, including systems from Group Bull SA, Digital Equipment Corp., IBM, ICL, Inc. and Unisys Corp.

"We're [using] this as an opportunity to rationalize that and reduce it to a much more structured basis," he said.

National Power will install an IBM SNA net to support business systems applications such as accounting and personnel, and a DECnet network to support process-control applications for monitoring and managing more than 40 power-generating stations.

Yates said he expects to use the Open Systems Interconnection-based DECnet Phase V when installation of the new data networks begins at the end of this year.

National Power will install a new IBM 3090 mainframe at the data center it is building in Harrogate to anchor the SNA net. That will let the utility cut loose links to one of its newly formed competitors, which inherited the IBM mainframe that supported CEGB's SNA network.

Besides SNA, the network National Power currently uses most is an ICL net that supports mostly business applications. That network will be retained only until the applications running on it are transferred to the DECnet or SNA network.

On the voice side, the company will link more than 70 GEC-Plessey Telecommunications ISDX private branch exchanges to the E-1 net, Yates said. Most of the switches are existing analog PBXs that will be upgraded to digital. About 95% of the new network will be digital, even on the local loops, he said.

Another important application the E-1 net will support is videoconferencing among the three major nodes and a research site in Leatherhead, England. That will help National Power managers, about half of whom have been relocated, implement a host of new procedures and organizations, including marketing and finance units that were previously unnecessary because CEGB was a state-owned company.

"You have to get people in touch with each other," Yates said. "You've got to encourage and facilitate communication. And videoconferencing is one way to do that." □

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Worth Noting

“Sales of Microsoft Corp.’s OS/2, LAN Manager and SQL Server have been abysmal. OS/2 only has 214,000 users, or less than 1% of the PC operating system market; and LAN Manager has 200,000 users worldwide, or 2% of the installed LAN base; and only 1,000 copies of SQL Server have been sold to date.”

Lee Doyle
Local-area network analyst
International Data Corp.
Framingham, Mass.

Netnotes

Athena Software, Inc., a disk utility specialist, recently introduced a software product that facilitates file management on file servers running Novell, Inc.’s NetWare.

Called LAN Director, the software allows for point-and-shoot file manipulation from a menu and provides a graphical tree that helps users navigate through disk directories. Fifteen types of searches help users locate files using such criteria as file attributes, byte size, dates, owner and text content.

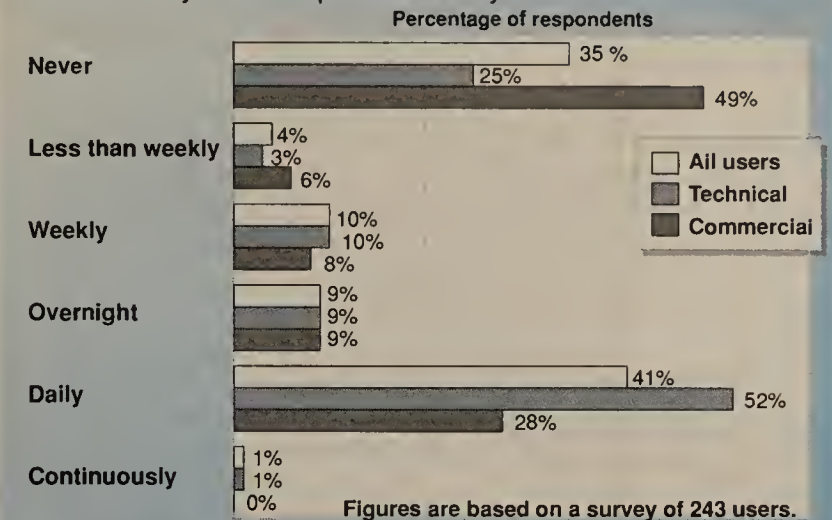
LAN Director indicates which drivers are local, which are server drives, which are mapped drives and which are search drives; it can also be used to map new drives. The product shows network administrators at a glance which users own what files and who has access rights to those files.

Comments of up to 78 characters in length can be attached to any file or directory on any drive in the local-area network. This helps users track files and directories by indicating what they hold and why they exist.

A cut-and-paste directory
(continued on page 22)

Flirting with disaster

How often do you back up the data on your file server’s hard disk?



Cabletron Ethernet bridge serves multiple functions

Board acts as repeater, supports network mgmt.

By Susan Breidenbach
and Laura DiDio
Network World Staff

NEW YORK — At last week’s PC Expo here, Cabletron Systems, Inc. introduced a product that combines the functionality of a bridge, repeater and network analysis and management tool in a single card that plugs into Cabletron’s intelligent Multi Media Access Center (MMAC) Ethernet hub.

Called the Intelligent Repeater Bridging Module (IRBM), the product is a local bridge that also provides for complete monitoring and control of Ethernet networks down to the individual port level. Future enhancements include a wide-area bridging and routing capability.

The single-board IRBM is priced at \$6,500, which is lower than the price of competing two-board solutions, Cabletron said.

“In the past, multiple slots of the hub were required to accommodate the functionality that is now built onto a single card,”

Future enhancements include a wide-area bridging and routing capability.

▲▲▲

said Chris Oliver, director of engineering at Cabletron.

The IRBM incorporates a new version, Release 1.2, of Cabletron’s Remote LANView/Windows net management software. This release runs under a graphi-

cal user interface that enables the user to view and identify problems on multiple devices and network segments simultaneously.

With earlier versions of LANView, network administrators could only monitor one device or LAN segment at a time and users could not obtain per-port error breakdowns or timer statistics. Now, strip and bar charts display a complete breakdown of net-

“The smart hub is a logical point at which to monitor the network,” Modahl said.

▲▲▲

work utilization, error rates and collision rates in real time.

The new release of LANView also includes more extensive alarm capabilities, enabling the administrator of the IRBM to set alarms on port status, link status and error thresholds.

Mary Modahl, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass., said Cabletron’s introduction of IRBM, with its inclusion of protocol analyzers and monitors, marks the beginning of a trend among smart hub vendors. “The smart hub is a logical point at which to monitor the network,” Modahl said.

The IRBM module will be available in July.

For more information, contact Cabletron at 35 Industrial Way, Rochester, N.H. 03867, or call (603) 332-9400. □

AT&T product blitz right on the mark

Users say AT&T is responsive to their needs and earning a top spot in the competitive LAN mart.

By Laura DiDio
Senior Editor

PHILADELPHIA — AT&T’s recent network product blitz, which has included the introduction of local-area network operating system and groupware software, will help make the company one of the top computer network suppliers in the 1990s, according to users and analysts.

Customers at AT&T’s recent Network Users Group-AT&T (NUGATT) meeting here, said many of the company’s recent product announcements were in response to user requests for more network offerings.

AT&T kicked off its product rollout in February at the Network ’90 Boston trade show with the introduction of the Star-

Group Software LAN Manager Server, a Unix version of Microsoft Corp.’s OS/2 LAN Manager. The StarGroup Software LAN Manager Server, along with Hewlett-Packard Co.’s LAN Manager/Unix, are two of the few bright spots in the lackluster LAN Manager market.

In April, AT&T introduced its Rhapsody Business Orchestration Solution, a LAN groupware product. Groupware is intended to increase the efficiency of work groups with tools that distribute tasks and track work in progress (“AT&T targets office with LAN groupware,” *NW*, April 2).

Only a handful of other vendors, including HP, Lotus Development Corp. and NCR Corp., of-

(continued on page 22)

Intel arm offers Ethernet print server for NetWare

By Susan Breidenbach
West Coast Bureau Chief

NEW YORK — Intel Corp.’s Personal Computer Enhancement Operation (PCEO) division entered the LAN market at last week’s PC Expo with the introduction of a compact print server for Ethernets running Novell, Inc.’s NetWare network operating system.

A self-contained unit the size of a paperback book, the NetPort print server can be used to attach two printers anywhere along the length of an Ethernet. This eliminates the need to locate printers next to file servers or workstations designated as print servers. It also frees up any workstations that act as print servers.

NetPort plugs into any existing T-connector location, and it can reportedly be installed in five minutes using only two commands from the NetWare Pconsole menu. The product uses NetWare’s print utility software so it does not have its own software taking up memory on the client or the server.

“Locating printers near users on LANs can be difficult, particularly given the trend to move file servers into limited-access areas,” said Mark Christensen, Intel PCEO’s product line manager. “NetPort allows printers to be connected anywhere along the network, providing for greater

accessibility. It enables users to spend more time creating documents and less time retrieving them.”

The product currently supports only thin-wire Ethernet, but Christensen said versions for thick-wire and 10BaseT Ethernet will be offered by year end. A model for token-ring networks will be added early in 1991.

He said the print server is the first in a series of plug-and-play local-area network enhancement products the Intel PCEO division intends to introduce in the near future.

NetPort contains a microprocessor, memory and network interface, plus one parallel and one serial port. These two ports enable one NetPort to support one of Hewlett-Packard Co.’s LaserJets and one of Apple Computer, Inc.’s LaserWriters simultaneously, for example.

The product incorporates Intel’s Flash erasable programmable read-only memory (EPROM) technology, which will allow for future upgrades via software. Traditional EPROM chips can be reprogrammed but not by a user simply sitting at a console and downloading software across the network from a floppy disk.

NetPort for thin-wire Ethernet comes with a three-year warranty and is available now at a price of \$695. □

AT&T product blitz on the mark

continued from page 21

fer groupware today.

Rhapsody, which is due out in the third quarter, runs on AT&T's StarGroup Software LAN Manager Server. It integrates personal computer applications such as Lotus' 1-2-3 with communications capabilities and work-flow management applications developed by AT&T Bell Laboratories engineers.

Two weeks ago, the company jumped into the local-area network superserver market with the introduction of the StarServer E, a symmetrical multiprocessing server based on the Intel Corp. 80486 microprocessor technology that supports all of the major LAN operating systems ("AT&T tries to lure users to Unix with superserver, *NW*, June 11).

The StarServer E announcement was followed by the introduction of a dozen other offerings, including three Fiber Distributed Data Interface bridge/routers, an Ethernet bridge, two new 10BaseT-compliant hardware devices and AppleTalk support for the Datakit II Virtual Circuit Switch. AT&T is licensing the router technology from Cisco Systems, Inc. of Menlo Park, Calif., but has developed its bridge technology in-house.

Additionally, AT&T, along with Proteon, Inc. of Westborough, Mass., is among the chief proponents of new technology that will support 16M bit/sec token-ring transmissions over unshielded twisted-pair wiring.

Thumbs up

Users at the NUGATT conference overwhelmingly gave AT&T high marks for quality, reliability and the increasing breadth of its network product line.

"I'm impressed with the fact that AT&T has introduced such a wide array of FDDI products and that they've done it within 18 months of when our users group first began asking for it," said Lawrence Hicks, manager of network and technical services at Bradley University in Peoria, Ill.

"We told AT&T that its initial projections of well over two years to get FDDI products to market was too long, and they responded by speeding the delivery dates by a full year," said Hicks, who was one of 125 attendees at the NUGATT conference.

"Based on our experience, AT&T equipment is reliable and easy to work with, and its pricing is competitive," Hicks said. "That all adds up to a one-stop shop for products, service and support."

John Kingland, director of telecommunications at Iowa State University of Science and Technology in Ames, agreed. He said he is especially pleased with the ease of integrating AT&T Information Systems Networks (ISN) with Ethernet and FDDI LANs.

Iowa State has a student popu-

lation of 24,000 spread out in 130 buildings on an 1,800-acre campus. "Our large complement of terminal servers won't go away overnight and may not go away at all," Kingland said. "AT&T is bridging the gap between ISN, and Ethernet and FDDI LANs."

ISN is an AT&T network product based on high-speed virtual circuit-switching technology that is used to link synchronous and asynchronous hosts, terminals

eventually migrate to FDDI.

"AT&T provides us with the easiest migration path; we can connect the new nets in a matter of minutes since we already have AT&T wiring and hardware," he said. "Having all AT&T equipment means we don't have to stock product spares from different vendors, and that keeps inventory, training and installation costs low."

Analysts also give AT&T high marks for its aggressive moves into the LAN arena. According to Mike Howard, president of Info-

"AT&T must take care to stay focused and not spread itself too thin."



and Ethernet LANs. ISN is widely installed in campus-type sites.

AT&T's Premises Distribution System (PDS) wiring scheme, which is based on standard twisted-pair wiring and fiber optics, can support ISN as well as AT&T Starlan, Starwan and FDDI offerings. This will allow Iowa State to preserve its existing investment in PDS and support a growing number of different types of networks, Kingland said.

"Since we've already got AT&T wiring installed, we can connect our new nets in a matter of minutes," Kingland said. Iowa State will purchase a variety of the FDDI offerings to interconnect its Ethernets in 25 campus buildings within the next year.

A communications specialist at a Midwestern Fortune 100 firm who requested anonymity echoed Kingland's comments about ease of integration. The company has 43 LANs bridged via ISN, is installing several Ethernet fiber-optic backbones and plans to

netics Research Institute, Inc. in San Jose, Calif., AT&T is making all the right moves to vault itself into the top tier of networking vendors.

"In the past two years, AT&T has formulated a smart strategy, and now they're fulfilling the promise of the strategy with LAN products that build on its foundation as the No. 1 Unix operating system supplier," Howard said. "From a business standpoint, it was smart of them to license Cisco System's router technology, but it's also good to see them building their bridges in-house."

Susan Frankle, a LAN analyst at International Data Corp. in Framingham, Mass., concurred. "If AT&T ships its FDDI products according to its announced schedule, they'll be at the forefront of the technology," she said. The one caveat, Frankle added, is that as "AT&T continues its LAN rush, the company must take care to stay focused and not spread itself too thin." ■

Netnotes

continued from page 21

and branch manager enables the net administrator to rearrange complicated directory tree structures by moving or copying entire branches of directories throughout the network. Other features include a built-in editor, file viewers and a user-definable application menu.

LAN Director runs on all current versions of NetWare, including ELS NetWare and NetWare 386. It supports NetWare's extended paths and can be used to manipulate NetWare-specific file attributes. The product is priced at \$295 per server.

For more information, contact Athena Software at 4915 Twin Lakes Road, Suite 19, Boulder, Colo. 80301, or call (303) 530-0693.

GUPTA Technologies, Inc. recently announced SQLNetwork

for Oracle, a gateway between Oracle Corp.'s widely used data base management system and GUPTA's SQLWindows front-end development environment.

The gateway enables applications developed in SQLWindows for workstation clients running Microsoft Corp.'s Microsoft Windows 3.0 or Presentation Manager to access Oracle data anywhere in a network supporting SQLNetwork.

Users can access any Oracle data base in the net by name, without knowing its location.

SQLNetwork for Oracle makes minicomputer- and mainframe-based Oracle DBMSs look like local data bases to the personal computer clients. According to GUPTA, one unique feature is a facility that lets users of SQLNetwork for Oracle browse backward and forward through sets of Oracle data on the screen.

SQLNetwork, GUPTA's platform for data base connectivity

Servers give NetWare users dial-in, dial-out functions

By Susan Breidenbach
West Coast Bureau Chief

SAN JOSE, Calif. — At the NetWare Users Conference and Trade Show here last week, Evergreen Systems, Inc. of Novato, Calif., introduced a new line of asynchronous communications servers that provide both dial-in and dial-out communications facilities on LANs running Novell, Inc.'s NetWare.

The FlexComServers are self-contained units that support as many as 44 modem lines via multiline modules and provide a dedicated communications processor to each line for maximum performance. The servers attach to a NetWare local-area network as external bridges, so only one network connection is needed.

Each line can be used for both dial-in remote access and dial-out modem sharing, but FlexCom lines can be dedicated to dial-in or dial-out service as needed.

"There have been many partial solutions that tend to address just one function, such as dial-in access," said Vince Conroy, president of Evergreen. "Our research revealed that what LAN users want is a total solution that does not compromise performance."

The FlexCom line consists of three models: The FlexComServer 100, a desktop tower enclosure that supports two to 20 communications lines; the FlexComServer 200, a floor-standing tower unit accommodating as many as 36 lines; and the FlexComServer 300, a rack-mounted unit that supports as many as 44 lines and is aimed at environments where rack-mounted modems are employed.

With any of the three models, the user can start out with a two-

line communications server and build on it as additional capacity is needed by plugging in more communications processor boards. The CP-1002 has two NEC Corp. V40 (super-XT compatible) processors, the CP-1004 has four V40s, and the CP02286 has two Intel Corp. 80286 chips.

Each server includes either an Ethernet, Arcnet or token-ring interface card, and comes with FlexCom/Manager software for configuring, monitoring and controlling the communications lines in the FlexComServer. The software creates an audit log that keeps track of the activity on each line, including dial-in and dial-out connections, valid and invalid user logon attempts, logon changes and line resets.

A special watchdog module in FlexCom/Manager can be used to verify that all communications processors are up and running. The watchdog feature automatically detects and restarts stalled lines.

If the lines connected to the FlexComServer constitute a "hunt" or "rollover" group set up by the phone company, a single primary number can be given out to all remote users sharing the dial-in facility. If the primary number is busy, the incoming call is automatically routed to the next free line in the group.

Pricing of the FlexComServers depends on configuration and starts at \$2,990 for a Model 100-E with two V40-based dial-in lines. Dial-out capability can be added for \$200 per line. The products are available now.

Evergreen can be contacted at 1510 Grant Ave., Suite 102, Novato, Calif. 94945; (415) 897-8888. ■

among dissimilar mainframes, minicomputers and microcomputers, has two components: SQLHost and SQLGateway. SQLHost resides on the host and transforms it into a data base server that accepts SQL requests routed to it by SQLGateway. SQLGateway resides on a workstation and turns it into a data base gateway server on any Network Basic I/O System-compatible local-area network.

GUPTA currently has data base gateways to IBM's DB2 and now Oracle, and it plans to support IBM's OS/2 Extended Edition and SQL/DS; the Microsoft/Sybase SQL Server; and Ingres Corp.'s Ingres DBMSs by the end of this year. Communications protocols supported by SQLNetwork include NETBIOS, Transmission Control Protocol/Internet Protocol, Microsoft Named Pipes and IBM System Network Architecture. SQLNetwork for Oracle is priced at \$2,495.

GUPTA can be reached at 1040 March Road, Menlo Park, Calif. 94025, or call (415) 321-9500.

Shiva Corp. has completed its acquisition of Novell, Inc.'s FastPath LocalTalk-to-Ethernet gateway and is now the sole supplier of the product. Novell has ceased manufacturing and selling the product, and is referring all sales and technical support calls to Shiva.

The original LocalTalk-to-Ethernet gateway, FastPath was created by Kinetics, Inc. in 1985 and was subsequently acquired by Novell when the latter purchased Kinetics in 1988. FastPath supports Transmission Control Protocol/Internet Protocol, DECnet and Apple Computer, Inc.'s AppleTalk protocols.

For more information, write to Shiva at 155 Second St., Cambridge, Mass. 02141, or call (617) 864-8500. ■

MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Worth Noting

“**O**utourcing makes eminent sense because the network is ultimately a utility that is best managed by a utility provider. The applications that users put on the network will be what’s sexy in the 1990s.”

Patrick Springer
Director of industry
services consulting
Computer Task Group/TMC
Needham Heights, Mass.

Association Watch

Nominations for the fourth annual **Achievement in Managing Information Technology** awards are due by Aug. 15.

Sponsored by American Management Systems, Inc. and Carnegie-Mellon University in Pittsburgh, the awards honor executives who have made outstanding contributions to their organizations through effective use of computer and communications technology.

Last year’s winners were from Chrysler Corp., Citicorp, the Commonwealth of Virginia Department of Taxation, Levi Strauss & Co. and Royal Bank of Canada.

Nominations must be submitted by chief executive officers or other top executives of the organization. Finalists will be selected by Jan. 31 and honored at a ceremony in New York in May.

For more information, contact Jan Dodson of American Management Systems at (703) 841-5830.

To provide information and increase knowledge about electronic data interchange in the banking community, the **Bankers’ EDI Council** recently formed a speakers’ bureau.

Volunteers from the council have indicated their willingness to speak on a variety of topics. These include basic
(continued on page 25)

MANAGEMENT PROFILE



FMC Corp.’s Phillip Evans, incoming president of ICA.

New ICA chief sees challenges ahead

Q&A With more than 700 member companies, the International Communications Association (ICA) is one the largest and most influential users groups in the communications industry.

Next week, Phillip Evans, the telecommunications director at FMC Corp. in Dallas and a three-time member of ICA’s board of directors, takes over as ICA’s president for a one-year term.

Network World Senior Writer Wayne Eckerson recently talked with Evans about his plans for the coming year and his vision for ICA.

What are the major challenges facing ICA?

The first challenge will be to expand the membership base of ICA and increase the number of vendors that exhibit at our annual conference and summer and winter seminars.

There are many more user companies that have recognized the importance of telecommunications for keeping them robust and competitive. We would like these companies to participate in ICA so that we can grow from their experiences and they from ours.

Similarly, there are an increasing number of vendors developing telecommunications products. We need to know what their products and services are, and they need to know us and our needs. This will help create a win-win situation in which they manufacture products that satisfy users’ business needs.

There have been some hints that ICA may adopt the chapter structure. Is this true?

It has been discussed, and it

wouldn’t surprise me to see it evolve in the next two to five years. However, as much as our membership likes to see progress, there is a natural reluctance to change too dramatically. Adopting the chapter concept might take longer than some [ICA members] would like.

The chapter structure would allow members who share common geographic interests to meet more frequently. This would allow them to keep abreast of local exchange company activities and changing state regulations, for example.

“**I**t wouldn’t surprise me to see [the chapter structure] evolve in two to five years.”



The thing we don’t want to do is create problems for existing regional groups that might feel threatened if we established chapters in their area.

I feel there is plenty of room for regional groups and ICA chapters to coexist. Regional groups are frequently a mixture of vendors and users, and they frequently address the concerns of smaller companies that aren’t served by ICA.

As president of ICA, what major initiatives or programs are you planning for the coming year?

One of the things I want to do is start the year by conducting a
(continued on page 25)

Chevron’s net-based tools improve human resources

New services will field routine requests for info.

By Wayne Eckerson
Senior Writer

SAN FRANCISCO — Disseminating information about benefits, employment opportunities and company programs isn’t easy for a corporation with thousands of employees worldwide.

At Chevron Corp., human resources professionals are beginning to use a variety of network-based tools, including interactive voice response (IVR) systems and computerized kiosks, that will improve their ability to provide employees and people outside the firm with a range of accurate and up-to-date information.

The new services, which will be rolled out over the next two years, will free human resources professionals to focus on value-added services, such as counseling managers or employees on job-related problems and developing innovative training and support programs.

Currently, managers in Chevron’s approximately 150 human resources departments nationwide spend a good portion of their time fielding routine requests for information, such as verifying the employment and salaries of employees for outside agencies and looking up benefit information, according to Jay Stright, manager of human re-

sources information systems at Chevron here.

“Our goal is to provide human resources with technologies that allow them to be as creative as they want in developing new services,” Stright said. “Too often, technology is a constraint on innovation rather than an enabler.”

The new technologies will be supported by a new integrated human resources system that the oil and gas company cut over last fall, Stright said.

Dubbed Emphasizing People in Chevron (EPIC), the main-frame-based system consolidated a variety of disparate and incom-

(continued on page 25)



Chevron’s Jay Stright

EXECUTIVE BRIEFS

BY WAYNE ECKERSON

Retail chain gets serious about EDI. There’s nothing like a little competitive pressure to jump start a stalled EDI program.

K mart Corp. is a good example.

Three years ago, K mart viewed electronic data interchange technology only as a convenient and helpful way to do business, not as a critical strategic resource, according to David Carlson, senior vice-president of corporate information systems at the retail chain.

However, increasing competition in the retail industry and customer complaints about shortages of stock items convinced upper management to become more serious about the company’s EDI program, Carlson said.

When top management decided to focus on improving customer service, EDI was seen as the vehicle that would keep the shelves stocked and customers happy, he said.

“What was once a convenient way to do business quickly became a mission-critical project for us,” Carlson said.

Earlier this year, senior executives told all K mart suppliers they had 32 days to start using EDI if they weren’t already. Currently, K mart has 1,100 EDI trading partners, and Carlson said that number should increase significantly in the near future.

“Moving information between trading partners is absolutely critical to our success,” he said. ■

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NORTHERN TELECOM

TECHNOLOGY THE WORLD CALLS ON

New ICA chief sees challenges

continued from page 23

strategic planning session for everyone on the board. This will enable us to establish and share a common vision of what ICA should be and where it is going.

Once we do that, we can work in a more coordinated, focused fashion, even though we all have different areas of responsibility and interest. This is not to suggest we haven't coordinated our efforts in the past, but we have never had a formal planning session so that we could clearly establish our goals and objectives for the coming year.

I'm also dedicated to maintaining the currency and quality of our educational offerings. We are going to work hard to increase the funding levels of our new ICA Foundation to about one-quarter of a million dollars. [The ICA Foundation provides grants to colleges and universities to establish or expand telecommunications degree programs and scholarships to college students who want to major in telecommunications.]

We are also expanding our professional development pro-

tions products and services in language that senior executives and end users can understand.

What initiatives are being undertaken by ICA to help members deal with the growing shortage of skilled workers?

Our ICA Foundation is helping to increase the number of undergraduate and graduate students specializing in telecommunications. We are also providing assistance and funding to the University of Minnesota, which is undertaking a study to determine the telecommunications staffing needs in the industry and whether universities and colleges are capable of filling those needs.

More importantly, we are expanding our outreach to the secondary school level. We recently updated a publication designed for high school guidance counselors and students that describes the opportunities of choosing a career in telecommunications.

We feel we are covering all bases, from high schools to ongoing professional training, but we are only making a dent in the overall shortage of skilled telecommunications workers.

The theme of ICA's annual conference this year was "Building the Global Village." What is ICA doing to expand the international focus of the group?

One of the things we're doing is continuing our active involvement with [the International Telecommunications Users Group]. ICA and INTUG cosponsored an ICA World meeting in Brussels [Belgium] in February, which was successful. We are continuing to communicate with European and Pacific Rim communications groups and participate in joint activities when possible.

Also, it appears that our 1991 summer program in Boulder, Colo., will include a section on international networking. We also plan to expand our professional development program with courses on international networking.

As part of our membership drive, we are attempting to convince international user compa-

nies to join ICA and international telecommunications vendors to exhibit at our conferences.

What are the critical issues network managers will face in the next 10 years, and how will ICA help members deal with these issues?

Managers will need to totally redesign their networks. Fast packet will be a reality, as will

"We plan to expand our program with courses on international networking."

▲▲▲

DS3 circuits to user workstations. Users will be using more bandwidth-intensive applications such as video, CAM, CAD, optical storage retrieval and large file transfers.

ICA will help members deal with these developments by maintaining the currency and quality of educational programs.

Many people said attendance at this year's annual conference was down. Is this true, and if so, what are you doing about it?

It depends on what you mean by attendance. We didn't have as many walk-ins as in previous years, but anyone could have expected that. New Orleans isn't a hotbed of communications and computer companies like Dallas, where last year's conference was held.

However, we had a record number of ICA members attending. Vendors frequently expressed in one breath their dismay at not having throngs of people pressing to get into their exhibits and their excitement about the quality leads they got in New Orleans.

While there weren't as many users at the show, the ones who were there either make buying decisions at their company or directly influence the process. ■

Net-based tools improve services

continued from page 23

patible human resources management tools, he said.

EPIC is a set of human resources applications supported by relational data bases residing on an IBM mainframe in Chevron's San Ramon, Calif., data center. The applications handle employee records, organizational charts, training programs and medical benefits plans.

With EPIC, authorized human resources professionals, employees and managers at most Chevron locations will be able to access information maintained by EPIC using the firm's nationwide IBM Systems Network Architecture net.

Chevron's human resources departments have already linked EPIC to an interactive voice response system that outside parties, such as mortgage companies, can use to verify employment of Chevron workers.

Currently, this system handles an average of 250 calls a day that otherwise would have been fielded by human resources personnel, Stright said.

The system prompts outside callers using a push-button phone to input the social security number of the person whose employment they want to verify. Then it searches an employee data base at the IBM host. If the employee exists, the system gives the date when the employee was hired and an address for the caller to write to if they need to check an employee's salary. (Chevron is not allowed to give out salary information over the phone.)

The IVR system, which is essentially a microcomputer, has multiple ports for incoming

phone lines. On the backside, it is linked via 9.6K bit/sec circuits to the IBM host in San Ramon.

Chevron is also testing other uses for the IVR system that would let job applicants check the status of their applications by phone and let employees check the status of their profit-sharing plans or savings accounts at Chevron.

To supplement the IVR, Chevron is developing information kiosks that would enable Chevron employees to access information on benefits, request changes in medical coverage, inquire about employment opportunities within the company, sign up for training programs and even determine how much it might cost to send their child to college, Stright said.

Each kiosk, which will be dubbed Employee Self-Service Stations, will be equipped with a built-in touch-screen workstation. After entering a social security number and authorized personal identification number, an employee would use a menu-driven screen to choose among applications.

The kiosk workstation will run Easel software from Interactive Images, Inc. in Woburn, Mass. The software provides audio, video, graphics and touch-screen capability.

Like the IVR system, the kiosk workstations will be linked to the IBM host in San Ramon via 9.6K bit/sec lines.

"We are trying to build systems that enable people to modify and access data directly instead of having to go through a human resources professional," Stright said. ■

Association Watch

continued from page 23

EDI, EDI for Administration, Commerce and Transport (EDIFACT), ANSI X12 standards, security issues, partnerships between banks and value-added nets, cross-border EDI issues, as well as EDI and cash management, among other issues.

The Bankers' EDI Council was formed by the National Automated Clearing House Association in 1989 to assist the banking industry in meeting the EDI needs of corporate customers. It comprises more than 50 financial institutions.

For more information about the Bankers' EDI Council, contact Bill Nelson at (702) 942-9190. ■



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Worth Noting

"If you want to accelerate the progress of the economy [in East Germany], you must improve the telecommunications there. [Likewise] if you want to stabilize a democracy, you need [good] telecommunications."

Gerd Tenzer
Member of the board of directors
Deutsche Bundespost Telekom
Bonn, West Germany

World News

Earlier this month, AT&T cut over the first undersea fiber-optic cable running from the U.S. to the Caribbean and Latin America, dubbed **Trans-caribbean Cable System-1 (TCS-1)**.

TCS-1 consists of two 140M bit/sec fiber-optic lines wrapped into one physical cable. It runs from West Palm Beach, Fla., to Puerto Rico, the Dominican Republic, Jamaica and Colombia. AT&T will use the cable to support both switched voice and private-line services. Using digital voice multiplexing technologies, the cable will be able to support as many as 18,900 simultaneous telephone calls.

AT&T said TCS-1 cost \$130 million to build and install. It is the third undersea fiber-optic cable in service with a landfall on the U.S. mainland.

The board of governors of the London-based **International Telecommunications Satellite Organization** recently approved a Pan American Satellite Corp. petition to carry international satellite traffic between the U.S. and Bolivia, Panama, Trinidad and Venezuela. Panama and Bolivia will also be allowed to use Pan American Satellite facilities for communications with other Latin American and Caribbean countries. ■

East and West Germany to merge public nets, agencies

Single telecom agency vital for countries to unite.

By Barton Crockett
Senior Editor

BONN, West Germany — The governments of East and West Germany recently agreed to a series of measures designed to integrate the regulatory and technical infrastructures of their public networks.

At several meetings over the past two months, top regulatory and carrier officials in each country agreed to spend a total of \$32.5 billion through 1997 to bring East Germany's public net up to par with West Germany's.

The officials also agreed to merge, over time, the government agencies that operate and regulate each country's public network and to phase in a regulatory regime in East Germany that will mirror West Germany's existing system.

The initiatives are seen as essential in the drive to unify the two countries.

"Our strategy is based on the assumption that we will be one country in the near future, [maybe in] half a year or one year," said Gerd Tenzer, a member of the board of directors of

Deutsche Bundespost Telekom, which is owned by the West German government.

According to Tenzer, the first formal step toward the merger was taken last April when the ministers in charge of communications in each country signed agreements pledging to work together to create a unified communications authority.

As part of these agreements, Tenzer said, the ministers established 10 separate committees of network officials from each country to study ways to integrate the technical, regulatory and administrative network infrastructures of the two Germanies.

High priority

Tenzer said it was agreed that improving East Germany's public network infrastructure is the most critical task to complete in order for the merger to be successful.

"Our colleagues say the [public] network [in East Germany] is too bad for fax machines or modems," Tenzer said. "They have [central office] switches from

(continued on page 28)

RBHCs help Czechoslovakia build cellular mobile net

By Barton Crockett
Senior Editor

PRAGUE, Czechoslovakia — Bell Atlantic Corp. and US West, Inc. recently agreed to enter into a joint venture with the government of Czechoslovakia to build a cellular mobile communications system here and to help modernize the country's existing public network.

According to a letter of intent signed last month, Bell Atlantic, US West and Czechoslovakia's Ministry of Posts and Telecommunications will invest \$60 million over the next 10 years to establish a cellular mobile network that will be owned and operated by the three carriers in a joint venture.

US West and Bell Atlantic also will consult with Czechoslovakia's Ministry of Posts and Telecommunications on ways to upgrade the existing public network.

While terms of the deal have yet to be finalized, Bell Atlantic and US West agreed in principle to invest nearly half of the \$60 million needed to establish the cellular system. Since Czechoslo-

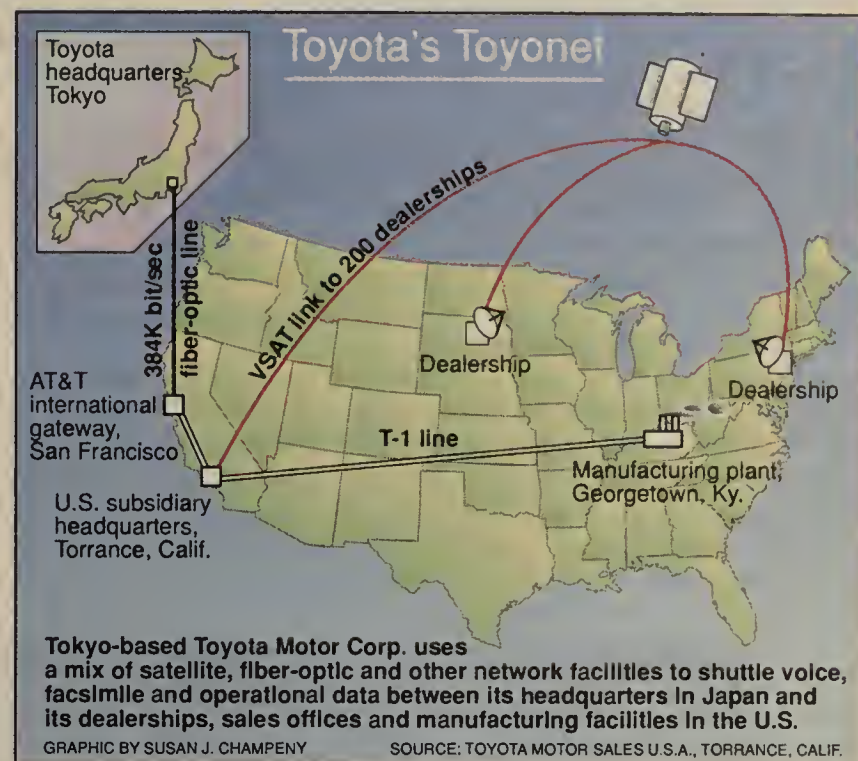
vakian currency is not readily accepted outside of the country, the Ministry of Posts and Telecommunications will invest the remaining portion by supplying the labor and much of the materials needed to build and operate the network.

The cellular network is expected to begin service in the Czechoslovakian cities of Bratislava, Brno and Prague within a year, and to be extended later to other major cities, railroads and highways. The Czechoslovakian Ministry of Posts and Telecommunications will own 51% of the new joint venture, while the two regional Bell holding companies will split the balance.

The RBHCs said they expect the venture to be a profit-making investment.

According to a US West spokesman, the cellular network will help improve the quality of network services in Czechoslovakia. The country has only 2.2 million telephone lines in service today and a population of 15.5 million. The spokesman added

(continued on page 28)



Toyota to grow net, increase reliability

Automaker's global Toyonet will be expanded to reach more dealerships, lower operating costs.

By Walter Sweet
West Coast Correspondent

TORRANCE, Calif. — Toyota Motor Corp. is in the process of expanding the domestic side of the international network it uses to relay voice, data and facsimile information between here and its home office in Japan.

Toyota is planning to add 200 very small aperture terminal links to the existing 100 connections supporting its Lexus dealerships as part of an effort to lower operating costs and increase network reliability and flexibility. The company wants to eventually establish VSAT links with an additional 1,000 Toyota dealerships.

The automaker's office here serves as a concentration point linking all North American dealerships and regional offices to Japan. The network, dubbed Toyonet, is used to support Systems Network Architecture traffic, fax transmissions and international voice links between Japan and the U.S.

The VSAT net will enable domestic dealerships to tap into an IBM 3090 Model 400 IMS-based mainframe at the hub here. The host runs parts inventory, vehicle distribution, and financial and service history applications developed in-house using COBOL. Any domestic site can use the hub to access this information or to reach Tokyo.

The Tokyo office can also call into the Torrance office to get information. "We're kind of the depository for data in North America," said Bob Arends, national operations manager at Toyota. "We're the go-between."

The California site is linked to Tokyo via a 384K bit/sec trans-pacific fiber-optic link. The fiber is backed up by a 256K bit/sec satellite link.

Arends said the 256K bit/sec link should be able to handle all of the company's traffic in the event of a cable failure because Toyota is not currently using the full bandwidth of the fiber. If the satellite backup is not sufficient to handle the full load, Toyota will make voice and data transmissions a priority and restrict fax transmissions.

Toyota's office in Torrance serves as a concentration point linking all North American dealerships and regional offices to Japan.

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International voice, fax and data transmissions are routed to the Torrance office and then out over a T-1 line to AT&T's international gateway in the San Francisco Bay area.

The network is based on Fujitsu America, Inc. DMIX multiplexers — one in Torrance and one in Tokyo. There is also a third DMIX at a manufacturing plant in Georgetown, Ky., that is linked to the Torrance site.

(continued on page 28)

Toyota to grow net, increase reliability

continued from page 27

Toyota installed the international links to save money on voice communications, but the net has paid off by saving money on data and fax transmissions as well.

Domestic faxes destined for Japan are routed to a Fujitsu Facsimile Mail System (FMS) in Torrance. FMS buffers the traffic and loads the faxes into a DMIX, which multiplexes the transmission with voice and data.

In Japan, the fax transmissions go through the multiplexer to a second FMS, which routes them to their proper destination. Sending faxes at high speeds with voice and data has saved the company

money on transmission costs. Previously, faxes were transmitted to Japan individually on a direct-dial basis.

According to Arends, the leased inter-

In addition to saving money, the network has allowed the company to perform more efficiently. "It's easier for us to manage the network," Arends said. With GE,

The leased international link saves Toyota about \$30,000 to \$35,000 a month, compared to the GE Mark III packet network.

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national link saves Toyota about \$30,000 to \$35,000 a month, compared with the General Electric Co. Mark III packet network services the company previously used.

Torrance users had to establish a telephone link with a GE hub in Cleveland to relay information between domestic dealerships and Japan. ■

East and West Germany merge nets

continued from page 27

1922 and 1932 and several from 1950. It is impossible to have data communications over a network like this."

Tenzer said the \$32.5 billion earmarked to improve the East German network will be contributed by both countries. West Germany will make its first contribution next year, a loan of \$1.18 billion to the East German carrier. Tenzer said this loan and others to follow will be used to replace obsolete central office switches, to install new packet-switching networks and to increase the number of telephones in use.

He said East Germany has only 1.6 million access lines serving a population of around 10 million. The goal is to increase the number of lines in service to around nine million by 1997.

On the regulatory side, Tenzer said East Germany last month agreed to phase in over a period of several years a regulatory system that mirrors the current West German regime. This regulatory regime will allow full competition in value-added network and satellite services as well as terminal equipment.

Tenzer added, however, that competition will not be allowed until East Germany's public network has been modernized. "It would be a mess if they had to start with modernization and deregulation tomorrow," he said.

Tenzer said it is likely that East Germany will begin to phase in rules allowing competition in terminal equipment and services markets in two to seven years. He declined to be more specific.

Finally, Tenzer said regulators and carrier officials in East and West Germany will work to merge their two bureaucracies. Tenzer said officials in charge of operations of the East German public network will be integrated into the same organizations that currently run the West German public net. He added that the regulatory officials will also combine their ranks. ■



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RBHCs help Czechs build cellular net

continued from page 27

that a backlog of 300,000 orders for new telephone lines exists.

"It will take us less than a year to get a mobile phone out there, while laying cable can take forever," he said.

"Sure, we've got to improve the existing [public network] infrastructure, too, since cellular mobile calls will go through it," he added. "But just getting the phones out there will be a big improvement."

The US West spokesman said business travelers from the West, in particular, could benefit from the new network because they will be able to lease mobile phones and take the phones with them while working in the country. He said that will be easier than trying to find public pay phones or operational terrestrial telephones.

The deal marks the latest in a series of moves by RBHCs to own and operate overseas carriers, including the recent construction of a cellular network in Hungary by a consortium including US West and the recent purchase of Telecom Corp. of New Zealand by Bell Atlantic and Ameritech for \$2.4 billion ("Ameritech, Bell Atlantic acquire New Zealand's telephone company," NW, June 18). ■

THE INDUSTRY STANDARD

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

Wellfleet routers support latest Apple net protocol

Wellfleet Communications, Inc. last week announced routing support for the AppleTalk Phase 2 protocol on its line of internetwork bridge/routers.

By supporting the newer AppleTalk protocol, Wellfleet's Link Node, Feeder Node and Concentrator Node bridge/routers allow users to transmit AppleTalk data, along with a variety of other protocols, across a single wide-area backbone.

In addition to AppleTalk protocols, the routers support Digital Equipment Corp.'s DECnet, Novell, Inc.'s Integrated Packet Exchange (IPX), Transmission Control Protocol/Internet Protocol and Xerox Corp.'s Xerox Network Systems protocols.

Wellfleet's AppleTalk Phase 2 protocol upgrade is available 30 days after receipt of order on all new Wellfleet bridge/routers. Current users can receive a software upgrade for \$1,000.

Wellfleet Communications, Inc., 12 DeAngelo Drive, Bedford, Mass. 01730; (617) 275-2400.

New gateway links LANs to SDLC, X.25, BSC lines

Digital Technology, Inc. recently introduced a gateway that enables local-area networks to connect to IBM Synchronous Data Link Control, X.25 and Binary Synchronous Communications lines for wide-area communications.

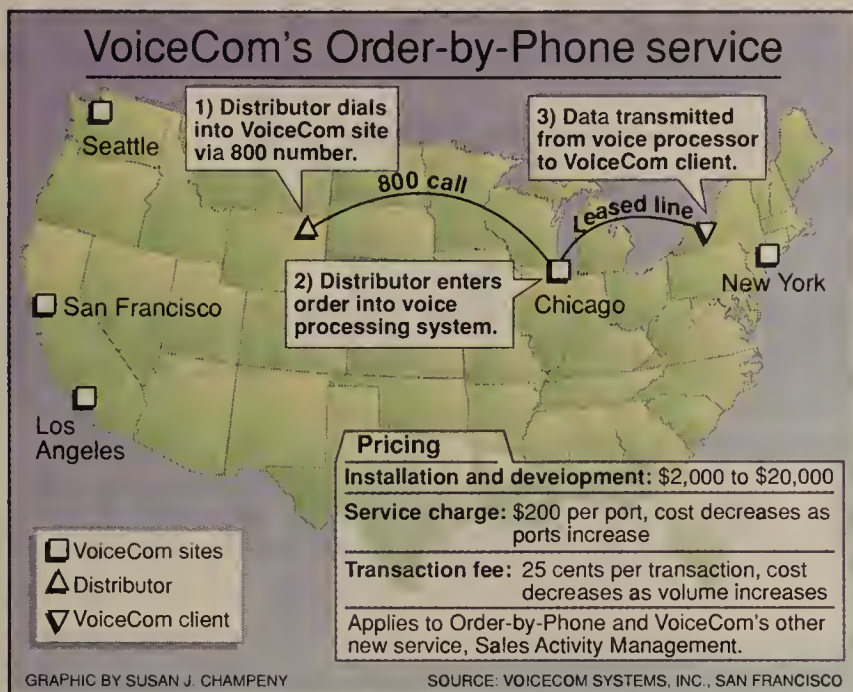
Digital Communications Controller Low Cost (DCCLC) consists of software and an interface board for an IBM Personal Computer AT running DOS or a Sun Microsystems, Inc. workstation running Unix.

The board has two ports for wide-area connectivity, each supporting speeds up to 56K bit/sec. The card supports dial-up and leased lines.

The board can convert LAN protocols to support any of the three wide-area protocols.

DCCLC has an on-board Intel Corp. 80188 microprocessor and a communications-oriented operating system, both of which free the computer's CPU from communication.

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VoiceCom intros services to ease order processing

Users enter orders via push-button telephone.

By Tom Smith
New Products Editor

SAN FRANCISCO — VoiceCom Systems, Inc. recently announced two voice processing services that make it easy for customers and salespeople to place orders and enter other sales data over the telephone.

The services, Sales Activity Management and Order-by-Phone, are based in part on applications that run on voice processing hardware located either at the customer site or at one of five VoiceCom sites nationwide.

Control by speeding up order placement and fulfillment. They are targeted at companies with field sales representatives and distributors that do frequent high-volume ordering and that have short sales cycles and fulfillment requirements.

Data base decisions

Users of either service can locate data bases at the VoiceCom site with the voice processor, or if the data base resides on a host at the customer site, they can lease a circuit for communications between the host and the voice processor.

In a typical scenario, a VoiceCom service user has an 800 number terminating at one of the five VoiceCom locations (see graphic). Customers call into the site using that toll-free number and place their order with the voice processor.

The VoiceCom processor then transmits the data over a leased line to the client's data base for order processing.

Both services are available now.

Installation and customization charges for both services range from \$2,000 to \$20,000, depending on the modifications a customer wants to make to the service.

Users pay a monthly service charge of \$200 per port. Per-port costs decrease as the number of ports used increases.

VoiceCom users will also pay a transaction fee that starts at 25 cents per transaction and decreases to 15 cents as volume increases.

For more information, VoiceCom can be reached in writing at 222 Kearny St., San Francisco, Calif. 94108, or call (415) 397-1900. □

The services are designed to improve customer service and inventory control by speeding up order placement.

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The Sales Activity Management service enables a company's salespeople to call into a central voice processing unit and enter orders and other sales related data via a push-button phone.

From a keypad, salespeople enter information such as their personal identification number, sales call dates, locations and products sold.

The other new service, Order-by-Phone, allows a VoiceCom client's customers to use a push-button phone to place orders.

The services are designed to allow companies to improve customer service and inventory con-

AT&T's Datakit II VCS line gets face-lift

Upgrades include access to multiple hosts and support for token-ring and AppleTalk networks.

By Tom Smith
New Products Editor

PHILADELPHIA — AT&T Computer Systems earlier this month announced several enhancements to its Datakit II Virtual Circuit Switch (VCS) line, including access to multiple hosts and support for token-ring and Apple Computer, Inc. AppleTalk networks.

Some of the new capabilities are packaged as standard features in Release 2.0 of the packet-switch software, while others are offered as options.

Release 2.0 of the software includes the ability to conduct switched, two-way communications between Datakit II VCS-connected terminals and X.25 hosts on private and public X.25 packet networks.

This enables users on public X.25 nets to transmit data onto a private Datakit II VCS-based net and route it to any Datakit node instead of just a predefined node.

AT&T has also expanded Datakit II VCS' disk storage in Release 2.0 to support a 40M-byte Small Computer Systems Interface (SCSI) hard disk and tape subsystem. Previously, the unit only

supported 10M bytes of storage.

The greater storage is needed in larger nets to support configuration data. It also gives AT&T's Datakit line an industry-standard configuration, according to Todd Giacobbe, systems marketing manager for network products at AT&T Computer Systems.

AT&T has expanded the disk storage in Release 2.0 to support a SCSI hard disk.

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The Release 2.0 enhancements and an SCSI are now standard on Datakit VCS units. Current users can upgrade for \$19,525.

AT&T also announced the Maintenance and Redundancy Control Module (MRCM), an optional interface for the Datakit II VCS that allows the unit to be

(continued on page 32)

Aquila unwraps adapters, hub for 10BaseT networks

By Tom Smith
New Products Editor

SUNNYVALE, Calif. — Aquila Communications, Inc. recently released a line of network interface cards and a network hub that comply with the IEEE 10BaseT draft standard for running Ethernet over unshielded twisted-pair wiring.

The company rolled out the AQ-PCE 108 TP and AQ-PCE 116 TP, 8- and 16-bit adapters that attach IBM Personal Computer ATs and XTs to 10BaseT nets, and the AQ-PSE 116 TP, a 16-bit adapter for IBM Personal System/2s.

Aquila also unveiled the AQ-Hub 12 TPE, a 12-port hub for Ethernets based on unshielded twisted-pair wiring.

10BaseT adapters

All three of the new 10BaseT adapters are based on the Fujitsu, Ltd. MB86950 EtherStar controller with an on-chip memory controller.

The EtherStar controller handles media-access control-layer protocol functions, while the memory controller handles reading and writing of data between the Ethernet controller and system memory.

The AQ-PCE 108 TP has 16K bytes of buffer memory, while the AQ-PCE 116 TP and AQ-PSE 116 TP both have 64K bytes of buffer memory.

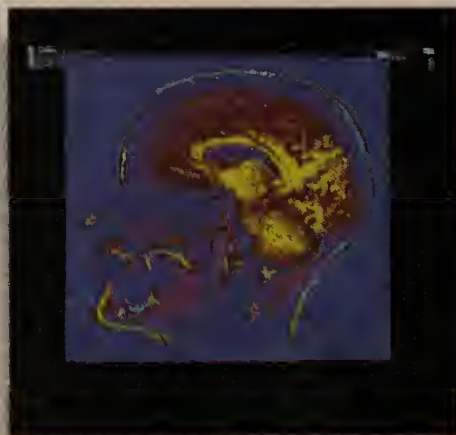
The adapters support software drivers for Novell, Inc.'s NetWare 286 and 386, OS/2 LAN Manager and a packet driver for Transmission Control Protocol/Internet Protocol software. The adapters also have a Network Basic I/O System emulator that allows them to support IBM's PC LAN Program.

The AQ-PCE 108 TP costs \$345, while the AQ-PCE 116 TP and AQ-PSE 116 TP both cost \$395. All three are available now.

In addition to supporting the

(continued on page 32)

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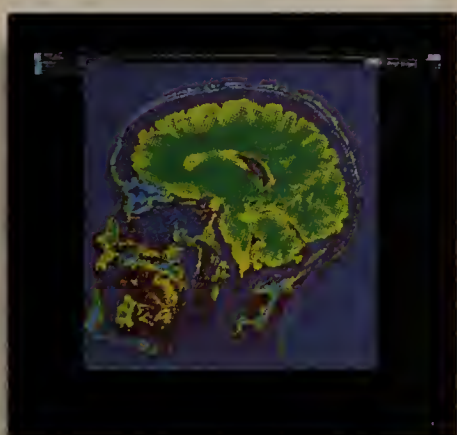
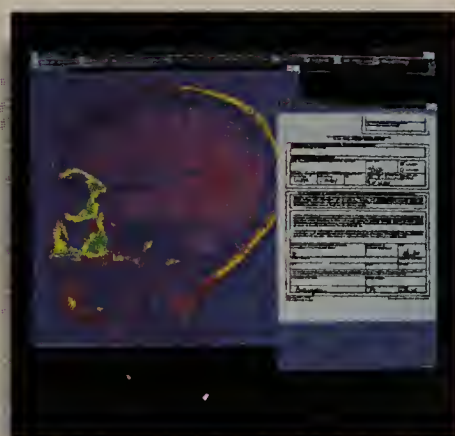
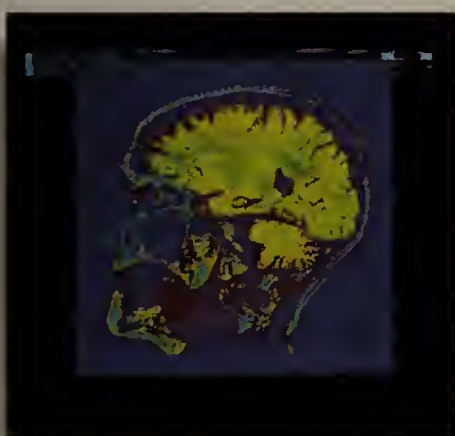
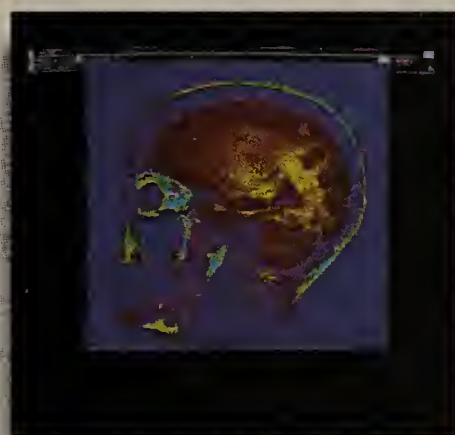
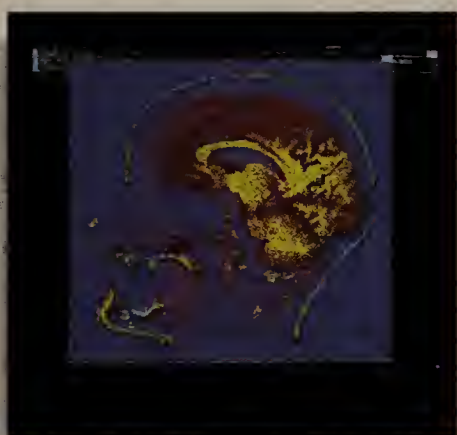
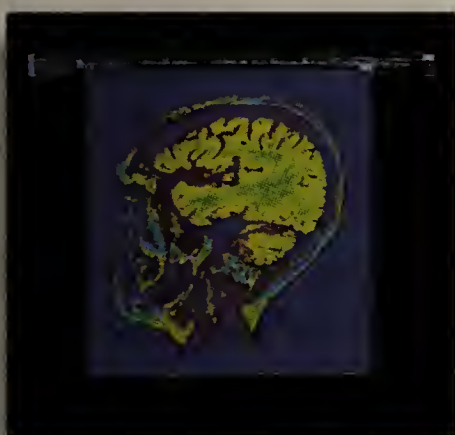
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NSA reduces memory needs of AdaptSNA LAN gateway

Software also supports IBM's SAA user interface.

By Tom Smith
New Products Editor

LAGUNA HILLS, Calif. — Network Software Associates, Inc. (NSA) last week announced a new version of its AdaptSNA LAN Gateway software that consumes less workstation memory and supports IBM's Systems Application Architecture (SAA) user interface.

NSA said it modified the workstation shell in Version 4.3 of the local-area network-to-host software so it requires just 58K bytes of memory on each LAN workstation. By contrast, earlier versions required more than 160K bytes of memory on each LAN node, according to Russ Hertzberg, product marketing manager at NSA.

AdaptSNA LAN Gateway, which is gateway software and an interface board that reside on an IBM Personal Computer AT server, enables users on Network Basic I/O System-compatible LANs to communicate with IBM mainframes using Synchronous Data Link Control and other protocols.

NSA reduced the memory constraints by rewriting portions of the code and by tightly integrating the gateway with its 3270/Elite terminal-emulation software, which is used to establish a terminal session with the mainframe.

Hertzberg said the low memory overhead gives NSA an advantage over other gateway vendors. Some gateway providers reduce memory consumption by supporting only the upper two layers of IBM's Systems Network Archi-

itecture protocols in the workstation shell. This, however, limits the functionality of the shell software and limits workstations to communicating as dumb terminals, he said.

Running the other five layers of the SNA protocols in the gateway server also requires the use of NETBIOS for gateway-to-LAN node communications, increasing traffic across the LAN and slowing response time, Hertzberg claimed.

Version 4.3 allows users to connect to a host via SDLC protocols. The LAN can also be linked to the host via Hayes' AutoSync protocol or the IEEE 802.2 Data Link Control protocol.

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AdaptSNA LAN Gateway, however, supports all seven SNA protocol layers in the workstation shell. This enables users to communicate across the gateway using IBM's link-level protocols, which are more efficient than NETBIOS, Hertzberg said.

Even though NSA has reduced the amount of memory for the gateway's workstation shell, AdaptSNA LAN Gateway can still support IBM LU 6.2 protocols and remote job entry (RJE) protocols.

Users will need to allocate 140K bytes and 170K bytes of

memory to support LU 6.2 and RJE protocols, respectively.

Common user interface

The other key enhancement to AdaptSNA LAN Gateway is support for IBM's SAA Common User Access (CUA) graphical user interface. The earlier release of the software had a character-oriented interface that was less user-friendly. Support for CUA will mean that a user of other CUA-compliant products will be able to more readily adapt to the new SNA gateway.

AdaptSNA LAN Gateway Version 4.3 allows users to connect to a host via SDLC protocols. The LAN can also be linked to the host via Hayes Microcomputer Products, Inc.'s AutoSync protocol or

the IEEE 802.2 Data Link Control protocol.

Pricing for the new version of the gateway software, available now, starts at \$995 for a version supporting two LAN nodes and ranges up to \$5,995 for a version supporting 128 LAN nodes. Pricing includes the 3270/Elite terminal-emulation software for each LAN node, as well as support for Advanced Program-to-Program Communications and RJE.

NSA can be reached in writing at 39 Argonaut Hills, Laguna Hills, Calif. 92656, or by calling (714) 768-5049. □

faxes using a Hewlett-Packard Co. LaserJet.

The card is also a Hayes Microcomputer Products, Inc.-compatible 2,400 bit/sec modem with automatic fallback to 1,200 and 300 bit/sec. It features a phone book with view and edit functions to store modem or fax numbers.

The product can automatically detect whether incoming calls are fax or modem transmissions. Other features of the Hook-UP include a background mode, which allows users to delay transmissions, and the ability to receive fax calls while working on another application.

The Hook-UP FX96/24 is available now and costs \$495.

Computer Peripherals, Inc., 667 Rancho Conejo Blvd., Newbury Park, Calif. 91320; (805) 499-5751.

Sharp unveils VLSI-based 9.6K PC modems

Sharp Digital Information Products, Inc. recently intro-

duced its first personal computer modems, a 9.6K bit/sec internal modem and a 9.6K bit/sec external modem.

The new **9624** internal modem and the **9624e** external modem are both 2,400/9.6K devices that use Sharp's very large-scale integration modem chipset. Both models have Microcom, Inc.'s Microcom Network Protocol (MNP) Level 5 error correction and Sharp's Extended Baud Rate technology, which allows a 2,400 bit/sec based chipset with MNP Level 5 to provide 9.6K bit/sec asynchronous operation.

The 9624 internal modem is a card that will fit any 8-bit personal computer slot. Both modems comply with standard modem commands, including the Hayes Microcomputer Products, Inc. AT command set.

The 9624 costs \$299, and the 9624e costs \$399. Both should be available this summer.

Sharp Digital Information Products, Inc., 16841 Armstrong Ave., Irvine, Calif. 92714; (714) 261-6224. □

Datakit II VCS line gets face-lift

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switched from a primary net management interface to a backup in the event of a failure. The management interface communicates with AT&T's StarKeeper network management system to monitor and control the Datakit II VCS. In the past, users had to switch manually.

MRCM is available now and costs \$9,000.

AT&T introduced another Datakit II VCS option called the Synchronous Asynchronous Multiplexer (SAM) Multiport Link, which connects the packet switch to as many as eight SAMs at remote sites. A SAM is a multiplexer that allows as many as 508 remote devices to be linked to a single port on a Datakit II VCS in another location. In the past, users needed a SAM unit in the main site to support each SAM in a remote site.

The SAM Multiport Link, also available now, costs \$11,000.

AT&T rounded out the Datakit II VCS line with an entry-level version of the switch, known as Entry-Level Node. It can support a maximum of 350 end-user devices. The existing Datakit line supports more than 2,000 devices without using multiplexers. The new Entry-Level Node, like its predecessors, supports a maximum of 3,500 virtual circuit connections.

The Entry-Level Node, which is available now, is priced starting at \$55,000.

AT&T also rolled out an optional Binary Synchronous Communications interface for the Datakit II VCS that enables up to eight IBM 3270 terminals to gain switched access to as many as eight IBM hosts. The interface is available now and costs \$9,500.

Support for AppleTalk

A pair of optional products included in the recent announcement enable AppleTalk local-

area networks to be linked over Datakit II VCS networks. The Local Area Network Access Module (LAM) resides in a Datakit II VCS and connects two AppleTalk or EtherTalk LANs to the packet switch.

At the central Datakit site, users require a LAM Manager unit, which controls LAM nodes and supports connection of up to 40 LAMs to the central Datakit node. The central Datakit node is linked to the LAM Manager over fiber-optic cable.

LAMs function as AppleTalk or EtherTalk routers, or they can function as gateways between AppleTalk and EtherTalk LANs.

Scheduled to be available in the fourth quarter, LAMs cost \$6,352 each, while LAM Managers cost \$37,125 each.

Finally, AT&T rolled out Datakit II VCS LAN Communications Server, an optional gateway that enables 4M and 16M bit/sec token-ring LANs running a variety of network operating systems to communicate with other token-ring LAN users over a Datakit II VCS network.

The gateway function is supported on an IBM Personal Computer AT outfitted with LAN Communications Server software and an interface board for physical connection to the Datakit II VCS.

The LAN Communications Server supports both Systems Network Architecture/Synchronous Data Link Control and X.25 interfaces. It supports LAN operating systems including Novell, Inc.'s NetWare, AT&T's StarGroup, Banyan Systems, Inc.'s VINES and 3Com Corp.'s 3+.

The LAN Communications Server, available in July, costs \$1,425 for hardware and software.

For more information, contact AT&T Computer Systems, 1 Speedwell Ave., Morristown, N.J. 07960, or call (800) 247-1212. □

Senior Editor Laura Didio contributed to this story.

First Look

continued from page 29

tions-related tasks.

The DCCLC card is available now and costs \$595.

Digital Technology, Inc., 43 Third Ave., N.W. Park, Burlington, Mass. 01803; (617) 229-9797.

IBM PC fax adapter works with Group III machines

Computer Peripherals, Inc. recently introduced a facsimile adapter for IBM Personal Computers that has a 9.6K bit/sec fax board and a 2,400 bit/sec internal modem on the same card.

The new **Hook-UP FX96/24** can exchange fax messages with any CCITT Group III fax machine. The fax function of the card automatically encodes ASCII text files or graphics files for fax transmission. Users can also transmit faxes to multiple locations. For incoming transmissions, the product allows users to print out

Aquila unwraps adapters, hub

continued from page 29

connection of 12 workstations to a 10BaseT Ethernet, Aquila's AQ-Hub 12 TPE also comes with a single BNC connector to attach a thin-wire Ethernet and a single DB-15 connector to link a thick-wire or fiber-optic Ethernet to the hub.

Eleven of the 12 unshielded twisted-pair ports on the hub are dedicated to receiving data from desktop workstations, while one port is capable of receiving data but can also daisy-chain to another unit.

When daisy-chained, the AQ-Hub 12 TPE can support a maximum of 1,024 nodes.

Auto partitioning

An automatic partitioning feature on the hub helps isolate net-

work failures by disabling ports connected to workstations that generate excessive errors. Each 10BaseT port has red and green LEDs, with red indicating a disabled port and green indicating an operable link.

The BNC and DB-15 ports each have a red LED that lights up when its port is disabled. Two additional LEDs display network-wide conditions, with green signifying data transfer and yellow indicating that collisions are taking place.

The hub costs \$1,595 and is expected to be available by the end of the month.

Aquila can be reached by writing to 846 Del Rey Ave., Sunnyvale, Calif. 94086, or by calling (408) 732-0700. □

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See The FAXNet Form on Page #40

OPINIONS

PRODUCT CLAIMS

BY RICHARD STERRY

It's time to stop all the industry psycho-babble

Telecommunications users are quite clear about what they want from vendors: They want their information systems to pass data back and forth as fast as possible with the least amount of expense and aggravation. But in pursuit of this goal, users are often barraged with confusing talk, data sheets and advertisements — industry “psycho-babble” that clouds the picture.

Both users and vendors are the victims of industry psycho-babble. Users suffer because they are frustrated by salespeople who can't answer direct questions. Vendors suffer because user frustration reduces market demand. Even the media suffers because they are called on to present articles about issues that are created only as a pretext to hype products.

Perhaps, between the lines, what vendors are really saying to users is that they ought to be smarter. Not only is that message insulting, but it suggests that vendors need this confusion to mask product shortcomings. A data communications equipment purchase is a high-risk decision that will proceed slowly if the customer doesn't feel safe. And customers won't feel safe until they are clearly told what they are buying.

Industry psycho-babble is more than just poor marketing — it's intentional deception. Fortunately, there is now a serious movement to stop industry psycho-babble: The Benchmarking Methodology Working Group, a committee of Internet members charged with formulating a set of standard definitions of product categories, product characteristics and benchmarks for evaluating those characteristics.

Started in November 1989 by Scott Bradner, a networking consultant at Harvard University in Cambridge, Mass., the group consists of approximately 30 industry vendors, customers and academics. Membership is open to all.

The group's recommendations, when completed, will take the form of an Internet request for comment (RFC). While the group can't force these RFCs on any vendor, the mere fact that they exist and were proposed by a broad group of industry participants will provide a common yardstick by which users can evaluate products.

The committee is currently working on two documents that should be completed this summer. The first is a dictionary of industry terms, such as throughput, router and filtering. The second document describes the measurements and tests for each of the defined product characteristics, such as throughput, as well as recommended formats for documenting and reporting these benchmarks.

Currently, the group's focus is on stand-alone networking devices such as bridges, routers and LAN multiplexers. In a second phase, the group will focus on systemwide performance issues, such as responsiveness to routing algorithms and topology changes.

Much of the discussion within the group centers on the debate over what should be included in the dictionary of industry terms. One test is whether a term can be clearly defined to be accurate in all its various uses.

“Latency” is an example of a term for which a common definition would be useful, but which may be too difficult to measure and describe consistently. This term describes the time needed to recover from events such as overloads. However, there may be so many different ways a piece of equipment can recover that a clear latency benchmark is impossible.

Despite some lively disagreements, the Benchmarking Methodology Working Group is committed to developing standards. By fall, users will know if product claims comply with Internet's RFCs or are simply another example of vendor hype. ■

Sterry, vice-president of product marketing at Micro-com, Inc., is a member of The Benchmarking Methodology Working Group.

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An IDG Communications Publication

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EDITORIAL

Congress should act on the growing ANI controversy

Congress seems to have its heart set on shaping U.S. telecommunications policy — witness its annual efforts to pass some form of legislation that would free the regional Bell holding companies from the restraints of the Modified Final Judgment.

Despite a lot of rhetoric about U.S. businesses falling behind international rivals, Congress has been unable to decide on a course of action in the telecommunications arena.

But there is one telecommunications-related issue on which Congress should act immediately: the controversy over automatic number identification (ANI).

A recent ruling by a Pennsylvania appeals court banning ANI service in that state raises the ugly specter of users and vendors being forced to deal with different ANI rules and policies in every state.

Today, both users and ven-

dors are carefully assessing the potential impact of the Pennsylvania ruling, trying to decide whether it will serve as a precedent in other states and whether similar restraints will be extended to interexchange services that offer ANI capabilities, such as 800 and 900 services (“Users rein in ANI projects after ruling,” *NW*, June 11; “Carriers study effects of caller ID ruling,” *NW*, June 18).

Corporate users see some very real benefits from applications that take advantage of ANI, but given ANI's uncertain future, they're leery about investing scarce resources to develop such applications.

Carriers are equally uncertain. They believe corporate and residential demand for ANI services will be strong, but they don't want to invest in services that may be devalued by overly restrictive legislation.

Clearly, the potential benefits of this important new tech-

nology cannot be realized in this atmosphere of uncertainty, confusion and concern.

What's needed is for Congress to set a national policy regarding ANI.

Congress must weigh genuine privacy concerns — concerns that some carriers have been a bit cavalier in addressing — against the legitimate uses of ANI in order to strike some kind of balance for the nation as a whole.

Economic pundits have long proclaimed that the U.S. economy is shifting to a service focus. ANI can be a valuable tool for improving the service capabilities and, thus, the competitiveness of a multitude of businesses. For this reason, it's important for Congress to act quickly on this controversy.

ANI is not an issue that can be dealt with effectively on a state-by-state basis. But it is an issue on which Congress could show some real leadership. ■

OPINIONS

TECHNOLOGICAL ADVANCES

BY JOHN MCQUILLAN

Boundless list of options can lead to user headaches

Recently, the wide range of options for connecting desktop devices to remote computer systems has grown even wider. Breakthrough technologies and new standards have arrived, providing new solutions to old problems.

The connecting options open to users can be classified by the amount of functionality each provides at the desktop.

■ With terminals such as the IBM 3270 and the Digital Equipment Corp. VT-100, the remote computer system handles computing, storage and the user interface; the local device is an unintelligent adjunct.

■ With personal computers that emulate terminals, such as those using a Digital Communications Associates, Inc. Irma board for 3270 emulation, the user interface is performed at the desktop, but the majority of the computing and storage is carried out remotely and the user interface to the application program is unchanged.

■ Another approach allows products to provide not only the user interface, but also a significant amount of storage at the personal computer level. These information download products include software systems such as Micro Tempus, Inc.'s Tempus-Link, which makes the remote computer system look like a file server but allows users to move files between the two storage systems.

While the use of this technology varies from customer to customer, often the remote mainframe application still performs all significant computing.

■ The most advanced approach is offered by client/server technology, in which a full range of computing, storage and user interface capabilities are present at the desktop, along with additional remote support for computing and storage. Novell,

Inc.'s NetWare is a good example, especially when used for data base server or electronic mail server applications.

Each of these approaches has its merits. Users base their selection on end-user requirements, performance needs, available funding and the nature of the installed base of desktop devices.

In addition, each of these technical approaches will meet user needs for many years. This means that each of these technologies will continue to evolve as a result of both innovation and standardization.

For example, while some ob-

Each new advance adds to the growing list of possibilities for network architecture.

▲▲▲

servers have been predicting the end of the interactive terminal, other forces in the industry are developing the technology for the X Terminal, which provides a full graphical interface, a high-resolution display and a mouse to support a modern local-area network-based version of interactive terminal computing.

Similarly, the Massachusetts Institute of Technology's Project Athena led to the development of the X Window System standard, which can provide users with access to a range of remote computer systems from many different personal computer and workstation platforms. Meanwhile, a whole class of software products is emerging that can be implemented at both the mainframe and the microcomputer level.

However, the largest amount of activity seems to be focused on client/server products. The major systems vendors have their entries, such as IBM's Systems Application Architecture

Office and DEC's All-In-1 Version 2, as do the leading personal computer software suppliers, such as Lotus Development Corp.'s Notes.

Each of these approaches to sharing responsibility between desktop devices and remote computer systems calls on a very different set of capabilities from the network. In addition, these approaches have widely differing profiles for the number of transactions per second, the transaction size and the predictability of the traffic.

The technological possibilities are multiplying in several dimensions at once. Only a few years ago, MS-DOS was virtually the only operating system for most personal computers. Now the choices include the Macintosh Operating System, OS/2 and, increasingly, Unix for both clients and servers.

The choices for servers are equally diverse, ranging from Novell's DOS-based NetWare and Microsoft Corp.'s OS/2 LAN Manager to the many Unix-based LAN servers available today.

In yet another display of diversity, the industry is split about the appropriate nature of servers. Some users contend that dedicated servers are the best way to build large-scale operational network computing environments, and for them, client/server computing is the answer. Others are equally convinced that peer-to-peer LANs, which don't require a dedicated server, are more practical since clients can easily share files and peripherals.

Each new advance in personal computers, workstations, operating systems and LANs adds to the growing list of possibilities for network architecture.

While having this many options may sound like a good thing for users, it will create a lot of headaches in the years ahead for network planners.

We never discard any of the old approaches entirely, though new technologies arrive at an amazing rate. The possibilities continue to multiply. ■

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TELETOONS

BY FRANK AND TROISE

And now, a representative of our new parent company would like to give the networking department some details on the upcoming merger...



LETTERS

On price caps and the MFJ

I would like to respond to Alan Pearce's recent column ("Appeals Court ruling has far-reaching implications," NW, May 28) and to the comments of Federal Communications Commission Chairman Alfred Sikes ("Sikes speaks out on price cap dispute," NW, May 28).

Pearce's analysis incorrectly interprets the recent Washington, D.C. Circuit Court of Appeals' decision. Specifically, the statement that the appeals court decision was "bad for [the regional Bell holding companies'] competitors" is incorrect. Most notably, the appeals court affirmed the lower court's finding that the FCC was incapable of controlling the behavior of the RBHCs.

The appeals court upheld the district court's findings that nothing has changed that would alter the original theory of the case — that is, the FCC's inability to regulate the monopoly RBHCs. If the appeals court had disagreed with this conclusion, it would have reversed the district court's findings — but it did not.

Instead, it remanded the decision back to U.S. District Court Judge Harold Greene. This remand was a technical one and not based on the questioning of any substantive findings of the lower court.

This leads me to the second issue that I wish to address: price caps for the RBHCs. Sikes characterizes the existing rate-of-return regulations as "bankrupt." Thus, the chairman concludes, "Price caps should be implemented for local carriers." However, I submit that the FCC's enforcement of existing rate-of-return regulation is bankrupt, not the form of the regulation.

The chairman's logic suggests two things. First, it suggests that any other method of regulation would be better than rate-of-return regulation.

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Network World welcomes letters from its readers.

Letters should be typed, double-spaced and sent to Editor, Network World, 161 Worcester Road, Box 9172, Framingham, Mass. 01701.

Letters may be edited for space and clarity.



Networks that make sweet music

By KRIS HERBST

The music industry is about to change its tune. Until recently, relatively little attention has been focused on networks that transmit high-quality audio signals. However, this situation is changing, to the delight of those involved in recording and broadcasting.

Techniques for transmitting audio by satellite and fiber-optic cable are becoming more sophisticated (see "Electronic Muzak," page 39). In addition, an audio version of a local-area network that should be particularly useful for sound and multimedia studios is finally emerging.

More than 30 of the top recording studios in the country are interconnected by a network of fiber-optic and satellite links operated by Landco Labs, Inc., located in Rancho Santa Fe, Calif. This network is used to transmit spoken parts of television and radio commercials, known as voice-overs, that are recorded in one studio for a commercial being produced at a studio in another location.

Landco operates a network of leased, 15-kHz analog and digital land lines that connect client studios to Landco's switching centers, which are located in major cities such as Los Angeles, New York and Chicago. At the local switching centers, Ramko Research, Inc. RS-1616 switches determine routing over Landco's leased land lines.

Herbst is a free-lance writer based in Washington, D.C.

Landco modifies digital switches, made by New York-based Monroe Electronics, Inc., to control the Ramko switches. Landco can operate the Monroe switches by remote control using a push-button telephone at its Rancho Santa Fe operations center.

Landco's switching centers are linked to earth stations owned or contracted by IDB Communications Group, Inc. of Culver City, Calif., one of the largest providers of satellite transmission services for radio and TV broadcasters.

IDB provides digital satellite links, converting the audio signals from analog to digital at its earth stations.

Landco also uses an expanding net of fiber-optic cables to connect studios from San Francisco to San Diego on the West Coast, and from New York to Washington, D.C. on the East Coast. These cables eliminate the .25-sec delay that occurs each time a signal travels between the earth station and a satellite.

(continued on page 39)

New technologies are instrumental in putting the music industry in tune with communications.



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(continued from page 37)

Because of this delay, performers in separate studios linked by satellite can't hear one another simultaneously, which rules out two-way, closely synchronized interactions in real time.

But live or prerecorded audio can be sent from an originating studio via satellite to a second studio, where performers can play or speak in sync with that sound. The combined result can be heard at the originating studio one-half second or longer after its transmission begins.

In a pioneering recording session in 1987, musicians and technicians in Master Sound Astoria Studios in Astoria, N.Y., and Stevie Wonder's Wonderland Studio in Los Angeles established a satellite link to demonstrate this technique. "We did the world's first all-digital, bicoastal, interactive recording session by fiber-optic cable and satellite," says Maxine Chrein, who along with Ben Rizzi is co-owner of Master Sound Astoria Studios.

In Los Angeles, Wonder and backing vocalists sang Wonder's antidrug song "Stop, Don't Pass Go" while accompanied by instrumental tracks that had been prerecorded on a 24-channel digital audio tape recorder. As is customary for recording sessions, this was converted to an analog, two-channel stereo monitor mix that could be fed into speakers or into participating musicians' headphones.

A Sony Corp. PCM 1630 converted the monitor mix to a compact disc-quality, 22-kHz, stereo digital signal, encoded as a black and white video signal so it could be transmitted over a standard portable video earth station set up in the parking lot of Wonder's studio. Recording studios commonly use this method, known as the Sony F1 format, to convert CD-quality digital audio to a video signal for transmission or storage on a videocassette recorder.

"The PCM 1630 has been and, for the foreseeable future, will be the worldwide standard for CD mastering," says Lon Neumann, applications manager for the professional audio division of Sony Communications Co. in Burbank, Calif. "All projects that are submitted for CDs are, at some point, processed by a 1630."

Bicoastal downlink

The signal from Los Angeles was downlinked at a teleport on Staten Island, N.Y., and transmitted on a fiber-optic cable that connects the teleport and Master Sound Astoria. Since the fiber was installed, Master Sound Astoria has been using the same type of encoding equipment, made by Hudson, Mass.-based Artel Communications Corp., that large broadcasting networks use to simultaneously transmit wideband video and multiple audio subcarriers on a single optical fiber.

At Master Sound Astoria, a PCM 1630 reconverted the signal from Los Angeles to an analog monitor mix. While listening to the mix, producer Nile Rodgers played an accompanying guitar part and a boys' choir added vocals. These performances were transmitted back to Los Angeles on a second transponder where, after synchronizing, they could be added to the final mix.

Observers in Los Angeles were able to hear the combined result immediately because they were listening to the signal through a

“The PCM 1630 is the standard for CD mastering.”



device that added a half-second delay, synchronizing it with the incoming New York signal. This process was repeated in reverse so that Wonder could contribute a harmonica part to the theme song for the *Moonlighting* television show, which was being recorded by Rodgers in New York.

At the same time, video cameras in both studios were relaying images of the participants over another pair of satellite transponders. "It was almost like they were in the same room because if you look out of a studio control room [window], you see all the players," says Peter Wargo, an engineer at Wonderland. "This did the same thing, but instead of looking out of the glass, you just looked at the TV monitors."

"It was very high-quality teleconferencing," Neumann adds. "The beauty of the digital transmission medium is that it has no effect on the sound. You get audio that is first-generation quality."

Master Sound Astoria will probably do more of these remote recording sessions after it opens Master Sound Riga, a huge new recording studio in the Soviet Union designed to take advantage of underutilized Soviet and Eastern Bloc musicians. The new studio will have sufficient room for a full symphony orchestra, a choir loft and its own pipe organ, according to Chrein. Master Sound Astoria says it hopes to maintain a full-time satellite link between its New York studio and Master Sound Riga using Master Sound Astoria's fiber-optic link to the Staten Island teleport.

"If we need to get a mix of some tracks, we can send whatever is needed in either direction, and because they are in the digital domain, they will still be first-generation recordings," Chrein says. "Ultimately, we would like to be able to send a complete master all at once, but right now

that can't be done economically. If we wanted to send 24 tracks of digital audio simultaneously, it would require a tremendous amount of space on a satellite."

High overhead

Transmitting one stereo audio channel using Sony's F1 video format fills a full satellite video transponder due to the large amount of overhead required for error checking. Master Sound Astoria has been working with Wadia Digital Corp. of Hudson, Wis., to develop a multiplexer that converts CD-quality digital audio to the digital service hierarchy of signals, which will make it possible to carry a single stereo digital audio signal on a T-1 channel or send multiple tracks on a T-3 channel. One satellite transponder can carry as many as 12 T-1 channels. "That's a lot less expensive than taking over an entire transponder," notes Don Moses, Wadia's chief executive officer.

MCA Records, Inc. in North Hollywood, Calif., uses Wadia interfaces to transmit master recordings over 22-kHz fiber-optic cables that interconnect equipment for editing and formatting digital master recordings before they are sent out to be mass-produced on CDs or audio tapes. MCA can use Wadia interfaces for fiber-optic cable runs of up to three kilometers, whereas "Sony recommends not using a copper cable length of more than 20 feet between digital audio tape recorders, and that is just not acceptable in production," says Pat

Weber, MCA's national technical director of research and development.

Fiber-optic cables allow much longer cable runs than coaxial and copper cables because they are not affected by the distortion and interference that occurs due to problems related to capacitance and interference. In the future, this technology may be used to transmit masters via satellite or fiber-optic cable from mastering houses to record companies and from record companies to manufacturing plants where they are mass-produced, Weber says.

Some recording studios, such as Master Sound Astoria and Masterfonics, Inc., a mastering and mixing operation in Nashville, are replacing the copper and coaxial cables that interconnect their studio equipment with fiber-optic cables by using a Wadia interface dubbed Digilink 20. This interface converts the standard digital audio formats for studio audio and music devices to optical pulses.

Cross-connect panels are located at the hubs of these systems, and they are reconfigured manually after a production is completed. But Moses predicts that electronic cross-connect systems will eventually become economical. "We plan to use optical fibers to provide LANs for film, mastering and music production facilities," he says.

Birth of the audio LAN

A true digital audio LAN with control features such as addressability has, until very recently,

eluded the audio industry. Since it was introduced in 1983, musicians and recording studios have been using the Musical Instrument Digital Interface (MIDI) to interconnect digital audio and musical equipment, and to transmit digital audio files (see "The making of MIDI," page 52).

However, the MIDI specification suffers from many shortcomings. It's a simplex network with an upper limit of 16 channels and a relatively slow speed of 31.25K bit/sec. In addition, the number of MIDI devices that can be linked on a bus is too limited, even for the home enthusiast.

Incremental improvements will continue to be made to the MIDI specification. However, according to Lachlan Westfall, president of the International MIDI Association and columnist for *Keyboard* magazine, "MIDI 2.0 is not in the works right now because nobody wants to make MIDI 1.0 obsolete."

Rather, what's needed is a high-speed LAN protocol that can transmit independent, multiplexed bidirectional streams of MIDI data without changing the speed of data transmission when under load.

"There have been ongoing discussions about this for about three years," Westfall says. "The first thing that looks like it may fit the bill is a product called MediaLink."

MediaLink is a LAN protocol that is MIDI-compatible and has been optimized for real-time applications by Lone Wolf, Inc. of

(continued on page 52)

Networking Muzak

While the largest radio networks distribute their programming using the Digital Audio Transmission System, which requires a \$9,000 to \$15,000 earth station to receive 15-kHz digital stereo audio signals, the "business music" industry has found a much less expensive method of distribution.

Business music, an outgrowth of what has commonly been called Muzak, distributes its programming to premises-based, "FM-squared" subcarrier-system very small aperture terminal receivers that cost as little as \$400. FM-squared satellite receiver dishes measure from 29 to 47.4 inches in diameter.

Some 15,000 business music customers now receive a variety of music formats, including rock, jazz, classical and background music, from one of three providers: Muzak Ltd. Partnership in Seattle, AEI Music Network, Inc., also in Seattle, or 3M in St. Paul, Minn.

New customers are signing up at the rate of 1,500 to 2,000

per month, according to Stephen Grissom, vice-president of Raleigh, N.C.-based Microspace Communications Corp., which provides a single uplinking facility for all three business music firms.

The system, developed by Wegener Communications, Inc. of Duluth, Ga., is called FM-squared because it fills a frequency-modulated carrier with 20 to 30 FM 15-kHz subcarriers.

The carrier is transmitted as a video signal and fills a single video satellite transponder, so receivers do not require any complex tuning equipment.

Each subcarrier is dedicated to a different program format. Most subcarriers are for music, but some carry advertising or special seasonal programming such as Christmas music. One subcarrier is a control channel that carries a data stream that addresses and controls each customer's receiver, determining which subcarrier or subcarriers it will tune into at any given moment.

By instructing receivers to

switch channels, customers can have different music formats with different tempos and styles played at different times of the day, ads from an advertising channel can be inserted into music programming and different formats can be directed to different zones on a customer's premises.

Subcarriers can also be used to send data, such as electronic mail, facsimile messages or price data, which can be downloaded directly to store computers.

Customers with video receivers can use subcarriers to send video programming to company employees.

These programs can then be recorded on-site by videocassette recorders operated remotely by a data channel.

"The music companies are no longer music companies," Grissom says. "They are network and telecommunications providers, and that's a rather significant shift. It's not your father's elevator music anymore."

— Kris Herbst

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Deregulation of carriers

The taming of telecom



Industry experts see a return to tighter regulation of local and long-haul carriers, the RBHCs and cable TV.

CONTINUED FROM PAGE 1
mission's perception of competition in the long-haul services market.

- Cable television will be subjected to more competition and more regulation.

- State policymakers will continue to feud with the FCC, particularly with respect to information age services brought about by the FCC's Third Computer Inquiry ruling and the implementation of Open Network Architecture (ONA). These feuds, which usually take place in the courts, will be won by the FCC.

- There will be more, not less, telecommunications-related litigation in the years ahead. This increase is being spurred in part by the FCC, which is using the complaint process to hold quasi-judicial hearings on such controversial issues as tariffs, accounting and auditing rules, as well as equipment and services bundling.

- There is a distinct trend toward enforcement of regulatory rules at both the federal and state levels. Rule breakers will be punished severely and will endanger their future business opportunities.

- The U.S. Congress will play a dominant role in shaping the telecommunications industry. If the higher courts do not act soon, Congress will take control of the

(continued on page 42)

Pearce is president of Information Age Economics, Inc., a telecommunications research firm in Washington, D.C.

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Modified Final Judgment from U.S. District Court Judge Harold Greene and give it to the FCC.

■ The regulatory policies currently under consideration will greatly enrich and empower U.S. users. The telecommunications industry is on the verge of providing user-friendly, low-cost services that will aid the intellectual, economic, political and social growth of U.S. ratepayers.

Ins and outs of federal policy

According to FCC Chairman Alfred Sikes, "Federal regulation of the long-distance telephone business too often seems to rest on the assumption that the break-up of the Bell System never happened. There also seems to be a widespread underappreciation of the fundamental strengths of MCI, US Sprint and [the National Telecommunications Network], and the marketplace agility of hundreds of other competing carriers. AT&T is no longer omnipotent astride a captive long-distance market."

With regard to CC Docket 9132, the notice of proposed rule-making on competition in the long-haul market, Sikes says he wants to encourage all parties filing comments to submit studies or research that will help the FCC make a well-considered competitive assessment.

Sikes is particularly interested in information pertaining to the underlying cost structure of AT&T's competitors — for example, information about their financial health. Market share alone, he says, does not provide significant advantages to AT&T.

According to Richard Wiley, a former FCC chairman and now a partner at Wiley, Rein and Fielding, a Washington, D.C. law firm, the FCC clearly has a predilection toward easing the regulation of AT&T.

The carrier is still dominant in certain markets — 800 services and international, as well as operator-assisted calls — and it is a major supplier of all types of equipment.

"It remains to be seen how all of this will come out but in my view, it is clearly headed toward diminished regulation of AT&T in some areas because of the perception that the long-distance marketplace is competitive," Wiley says.

Not surprisingly, Tom Norris, corporate vice-president of AT&T, agrees with both Sikes and Wiley. He says, "Pervasively regulating AT&T while continuing to protect all other long-distance companies impedes competition, deprives customers of choice and amounts to market allocation to the exclusion of AT&T."

According to Norris, the FCC must either lessen the regulation of AT&T to match that of the other major carriers or reregulate the other carriers to match the regulation of AT&T.

However, there are some seri-

ous opponents of AT&T deregulation on Capitol Hill, including Rep. Tom Tauke (R-Iowa). Tauke, an acknowledged policy expert who is a member of the House Telecommunications and Finance Subcommittee, is urging the FCC to go slow on AT&T rule making.

Tauke maintains that AT&T has more than 70% of the long-distance market and that there

should be a thorough investigation, not only of competition in the long-haul marketplace, but also of other telecommunications markets. AT&T disagrees with Tauke's figures, saying that it has less than 70% and that this percentage continues to decline rapidly.

Philip Verveer, former chief of the FCC's Cable TV Bureau, Broadcast Bureau and Common

Carrier Bureau, feels that the Reagan FCC, headed by Chairmen Mark Fowler and Dennis Patrick, essentially deregulated many of AT&T's business practices.

As a result, many tariff issues and problems that arose from the bundling of equipment and services are now handled by the FCC staff as part of its complaint procedures. So far, Verveer says, this approach is working well, al-

though it slows down the regulatory process.

David Fullerton, president of the Information Industry Association, agrees with Verveer.

"AT&T is essentially unregulated today," Fullerton says. "It seems to me that the Consent Decree resolved the issue of AT&T's business destiny when it was signed by AT&T and the Department of Justice and approved by

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Judge Greene in August 1982."

Chairman Sikes and the FCC will continue to play a dominant role in the regulation and business prospects for not only the RBHCs, but also the independent telephone companies such as Centel Corp., Contel Corp., GTE Communications Corp. and United Telecommunications, Inc.

"Today, the principal public policy priority is not just to en-

sure universal voice telephone service at reasonable and affordable rates," Sikes says. "That is still important. But equally important is developing a strong, coherent national policy for the future. Our cardinal rule concerns opening both domestic and overseas markets to the maximum extent possible. We believe that new entrants and established companies should be afforded a

chance to compete."

William Ferguson, chairman of Nynex Corp., agrees. "We need a strong nationwide initiative supporting the construction of a high-speed broadband network serving all Americans, not just the fortunate few," he says. "Congress can and must play a big role in setting the course for progress. Federal regulators must step up to the plate and

show the same level of leadership [as Congress shows]."

Morton Bahr, president of the Communications Workers of America, the industry's largest trade union, would like President Bush to appoint a bipartisan commission to develop a rational, coherent U.S. telecommunications policy. "I'd like to see a policy that encompasses all parts of the telecommunications industry,"

Bahr says. "It might not please all players, but the nation would be best served."

The White House appears to be on the verge of some response. Lawrence Lindsey, special assistant to Bush for domestic economic development, says the White House has privately communicated some principles on telecommunications policy that it would like Congress to follow. "We want to resolve bottlenecks without creating new ones," he says.

Congressional leaders agree that they, and not the FCC or Greene, should set national policy in telecommunications.

According to Rep. John Dingell (D-Mich.), chairman of the House Energy and Commerce Committee, it is the role of Congress to set industrial policy in the telecommunications and information industry.

Adds Rep. Ed Markey (D-Mass.), chairman of the House Telecommunications Subcommittee, "It is our intent to establish a comprehensive policy that will assure U.S. leadership in four areas: overall industry structure and services offered; the development of new technologies; the re-assignment of spectrum for the provision of new services; and the need for competition and re-regulation of the cable industry."

Ending unregulation

According to New York Law School's Professor Michael Botein, all of this means more regulation, not less, and an end of the so-called "unregulation" of the 1980s.

"This is quite definitely a period of regulatory retrenchment, not further deregulation," Botein says. "There will be no extension of the policies pursued and adopted by the ideological leaders of the past administration." He also points out that today's FCC is much more open and hospitable to Congress and the public than it has been in the recent past.

Wiley agrees with Botein. "Chairman Sikes deserves credit for the restoration of good relationships with Congress," he says. "The FCC is functioning effectively, thanks to the leadership of the chairman and the interest and effectiveness of the other commissioners."

Wiley says he is convinced that, with help from Congress and the courts, the RBHCs will be offered new business opportunities but will remain subject to regulation. He sees no letup in regulation for the independent telephone companies either.

There is some disagreement as to whether the local exchange companies need or deserve price cap regulation.

AT&T's Norris says, "AT&T agrees that incentive regulation for the [local exchange carriers] would be an improvement, but there are oceans of differences between price cap plans em-

(continued on page 45)

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(continued from page 43)

braced by local telephone companies and those acceptable to skeptical customers." He claims that implementing a plan that improves on rate-of-return regulation will be difficult work.

"I doubt we will see any early extension of the price cap regime," Botein says. "It is too controversial, too new and too close to the Reagan administration of the FCC."

Up in the air

David Wagenhauser, executive director of the Telecommunications Research and Action Center, a public interest group, says it's impossible to predict with any accuracy what will happen on price caps and other regulatory measures concerning the local exchange carriers.

"Everything is up in the air," Wagenhauser explains. "The future depends almost entirely on congressional action. Congress can determine the fate of price caps, the fate of RBHC and telephone company entry into cable, and the fate of RBHC entry into new lines of business. For its part, the FCC appears determined to end the deregulatory upheaval of the 1980s, and I think we can all be grateful for that."

According to the Information Industry Association's Fullerton, "Price caps have become much more controversial than was originally thought."

Fullerton predicts that opposition to the RBHCs extending their business activities into information services will continue.

"[RBHC opponents] are afraid that since the RBHCs have control over local facilities, they might easily be able to cross-subsidize other business activities and drive out or inhibit competition," he says.

Sikes, however, is confident that such cross-subsidies will not occur because:

- The cost accounting and allocation rules embodied in Part 64 of Volume 47 of the Code of Federal Regulations will prevent it. Recently, Sikes used Part 64 to impose a fine of \$1.4 million on Nynex for making illegal profits on equipment procurement and sales to its telephone companies — New York Telephone Co. and New England Telephone and Telegraph Co.

- Industry participants will watch over one another and report any alleged transgressions of the rules to the FCC.

Cable regulation

Almost everyone agrees that cable TV is going to be regulated and subjected to more competition, but not all agree that the telephone companies will be able to enter the cable TV business — at least not in the next two to five years.

Gigi Sohn, a staff attorney with the Media Access Project, a Washington, D.C.-based public interest group, says, "[The cable industry] took unfair advantage of the deregulation of the Reagan years, and now it is time to correct the worst of the past."

"Today, cable rates are outrageous," she continues. "But the reregulation of cable will not be as onerous as it was in the past. Chairman Sikes is leading the way with cable reregulation. He is aware of the vast increase in consumer complaints."

Sen. Howard Metzenbaum (D-Ohio), chairman of the Senate Antitrust Subcommittee, says he is concerned about the vertical integration of the cable industry and the growing consolidation of cable companies. Strongly in favor of reregulating cable TV, Metzenbaum concedes that Congress made a big mistake when it deregulated cable by passing the Cable Act

of 1984. But, he says, the FCC was also mistaken when it claimed that cable was competitive with other media.

"But, I'm not yet at the point where I'm prepared to substitute one monopoly — cable TV — for another monopoly — the local telephone company," he says.

Chairman Sikes has been in the vanguard when it comes to reminding cable of its own mortality. "Economic power in cable appears to be within the grasp of fewer and fewer hands," he says. "You cannot expect government to continue sanctioning, indeed, promoting and protecting cable as a sole provider of video services, while at the same time forgoing the regulation that historically has been placed on monopoly operations. The American people will not tolerate an unregulated mo-

nopoly indefinitely."

According to Ferguson, Nynex is ready to step in and compete with cable TV. "Is it in the public interest to prevent phone companies from offering information services? I don't believe so," he says.

Markey maintains that the country needs a new cable policy that will promote competition while still regulating an industry segment that effectively misled Congress when it claimed it would be subject to competition.

"When we passed the Cable Act, we were told that there would be cable TV overbuilds. There are none," he says. "We were told that direct broadcast satellite would be a competitor. It isn't. And we were told that multichannel multipoint distribution service, also known as wire-

less cable, would be competitive. It isn't."

State policy

Future state regulatory policy in the telecommunications industry is difficult or impossible to predict. Nonetheless, certain trends exist.

- Some states will adhere to strict regulatory vigilance, while others will conduct new regulatory and deregulatory policy experiments. However, the results of these experiments will be mixed. Therefore, the future holds no great promise of deregulation either for local telephone companies or cable companies.

- There will be continued conflicts between the FCC and the states over control of the regulatory structure under which

(continued on page 54)

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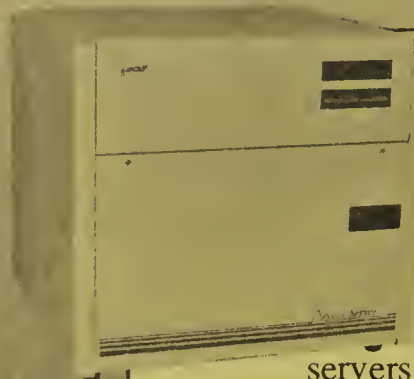
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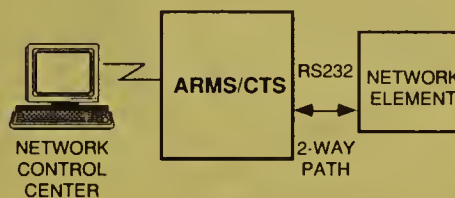
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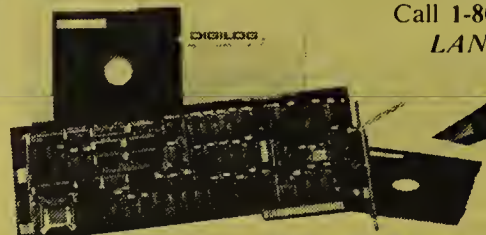
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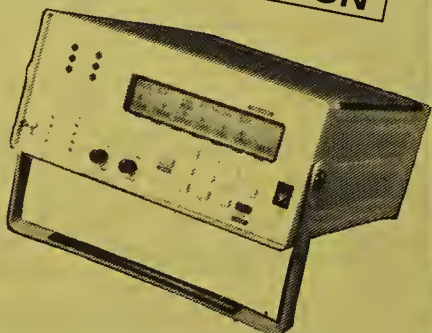
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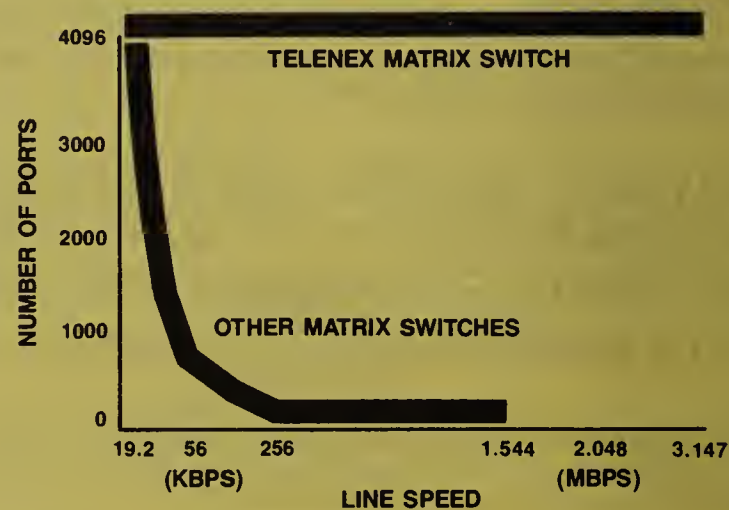
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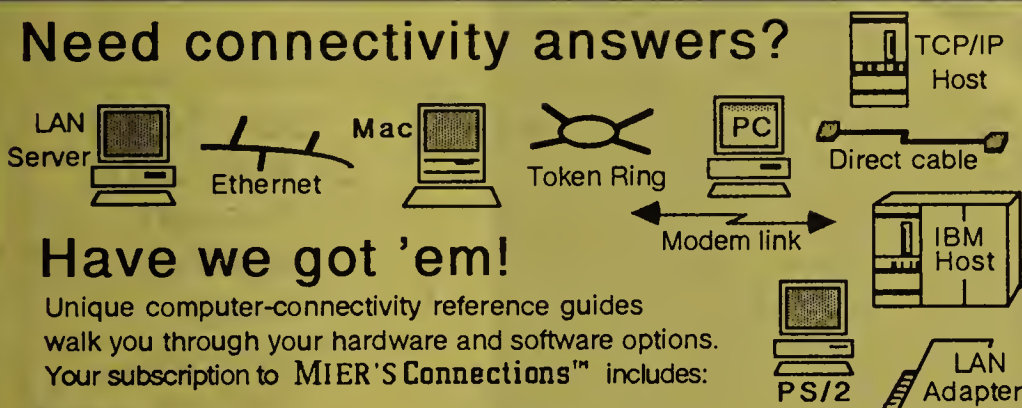
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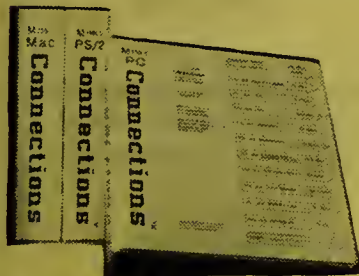
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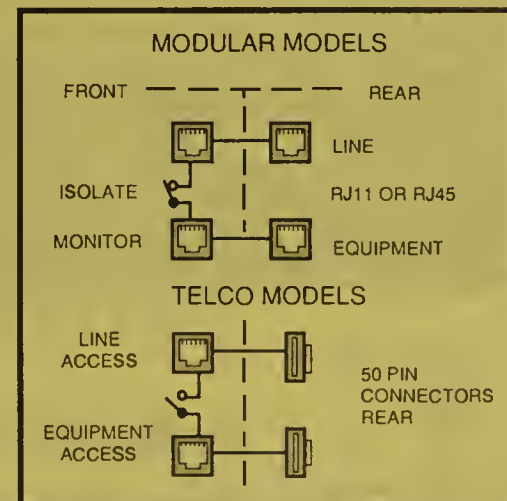
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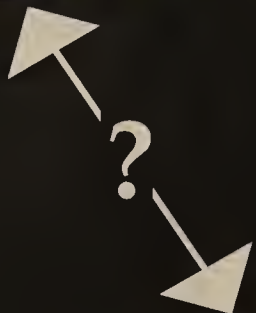
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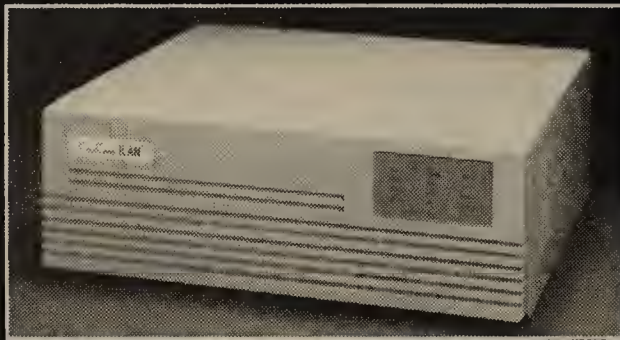
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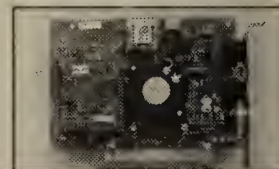
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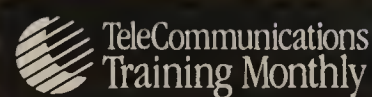
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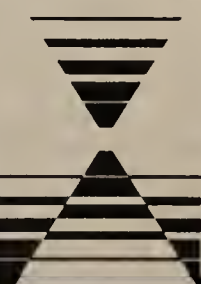
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Networks make sweet music

continued from page 39

Redondo Beach, Calif. The underlying concept of MediaLink is to create a LAN that can transmit any type of digital information, including MIDI, digital audio for on-line recording and editing, the Society of Motion Picture and Television Engineers (SMPTE) time code (the common standard used to synchronize tape and film machines), Small Computer System Interface signals, computer data and high-definition television signals.

MediaLink incorporates many of the features found in computer LANs and has special features for music, SMPTE, audio and video. It could eventually be used to integrate all the devices in a multimedia studio on one fiber-optic cable or to control a complex, live multimedia show that includes lighting, sound and video.

The current version of MediaLink transmits MIDI signals at 2M bit/sec, roughly 64 times the speed of MIDI, and is designed to eventually accommodate speeds up to 100M bit/sec. It uses either fiber-optic cables that can carry signals up to 2.5 km or less expensive plastic cables that can be extended as far as 60 meters.

MediaLink is accessed through connector boxes, called MidiTaps, that link each device to the network and convert MIDI signals to MediaLink's faster network signal. Audio equipment manufacturers may eventually begin incorporating MediaLink optical connectors into their equipment so that they can use MediaLink's full speed from end to end, which will accelerate studio automation and large file transmissions.

A MediaLink network can include up to 253 MidiTaps, and the theoretical limit for the number of channels on a MediaLink network is 524,288, enabling all the devices in a large recording studio to be interconnected via MediaLink.

MediaLink transmissions are divided into two categories: setup mode, which includes non-time-sensitive data, and performance mode, which includes the real-time data and synchronization messages that can't be delayed when the network becomes loaded with simultaneous transmissions. Performance-mode data is always given priority so that it is transmitted in real time.

Currently, the MidiTap can efficiently handle three to eight full-bandwidth streams of MIDI data.

MediaLink translates MIDI data into packets that include a destination address, specifying which MIDI port and channel should receive the data. If a device is located on another remote network, the addressing information will include instructions to dial up that device via a modem that is included in the MidiTap.

A MidiTap can transmit a mes-

sage to a single channel, multicast to a predefined channel group or broadcast to all channels. Unlike MIDI, MediaLink is bidirectional and sends back a message confirming that the transmission has reached its destination intact.

Internal software in each MidiTap keeps track of which devices are on each of the four ports on all MidiTaps in the network, the channels on which a device is sending or receiving information, and whether data for an instrument is being filtered. The parameters in any MidiTap can be altered from any other MidiTap, and the MidiTap software can be used to create a snapshot description of an entire studio's configuration of MIDI equipment for a specific piece of music or recording session.

MediaLink can store as many as 128 of these snapshot descriptions, called LanScapes. To make calling or changing configurations easy, LanScapes allow users to give a name to each channel on the ports of each MidiTap or to give a group of channels, connected to one or more instruments, a single name. MediaLink can define as many as 64,000 groups, and these groups can be used as if they were a single instrument.

LanScapes can be transmitted to other computers via the RS-232 port on each MidiTap. They can be edited or stored on floppy disks, or sent to a printer that generates a written description of all the configuration parameters. When a musician or engineer working in one studio transmits a LanScape to a remote studio so that both studios' configurations match, one studio effectively becomes a node, or extension, of the other.

Makings of the virtual studio

The MIDI specification has been augmented to include data transfer standards — the MIDI Sample Dump Standard and Standard MIDI Files (SMF) — that make it possible to transmit files between different types of audio and musical devices.

The MIDI Sample Dump Standard allows sound samples to be transferred between different manufacturers' sampling and memory or other devices on a network. SMF allows MIDI files to be transferred between different vendors' hardware devices or software programs.

These files contain passages of music and other sound programs that musicians create by assembling and combining sound samples and sequences with timing information and command messages.

Unfortunately, the Sample Dump Standard and SMF can't make direct transfers via MIDI. They require the use of telecommunications software, and MIDI files are usually transmitted between remote MIDI devices or networks via modem over phone

lines. Files can be uploaded to a bulletin board such as CompuServe, Inc.'s CompuServe for retrieval by other musicians. This allows musicians who are far apart to collaborate.

A new standard, called the MIDI File Dump Standard, mitigates this problem by allowing direct local transfers via MIDI at MIDI speeds, according to Jeff Rona, chairman of the MIDI Manufacturers Association. It will allow transfer of any kind of data on MIDI, including text and spreadsheet files.

According to Craig Anderton, a guitar and synthesizer player, "It's the standardization of files and samples that makes this whole thing possible." Anderton worked with rhythm and blues and jazz session players such as Airto Moriera and Cornell Dupree during the early 1970s. Last summer, he completed "Forward Motion," a solo album recorded in his home studio on a hillside in rural Mendocino County, Calif. Before that, he and Al Nespers, a bass player living on the East Coast, composed a piece for a single recording without meeting face-to-face, doing their collaboration via computer, modem and facsimile.

Anderton is now working on an album that is "a basic collaborative songwriting arrangement" involving five other persons "living anywhere from a couple of miles away to several thousand miles away." Anderton and his collaborators take turns working with a piece of music. "They supply me with the data and have me play with it," he says. "We usually just do a direct modem transfer."

Modem transfers of audio files, which contain the commands that allow musical devices on the receiving end to reproduce music or a sound, but not the sound itself, are relatively slow. "A song file is about 80K to 150K bytes," Anderton says. "At 1,200 [bit/sec], it takes anywhere from 10 to 15 minutes to transfer."

Files that contain a digital description of the sound itself, known as a sound sample, are much larger and transferring them can be even more time-consuming.

A 4-sec sound sample, if sampled at a moderately high sampling rate of 28.4 kHz, can take three minutes to transfer. A 2M bit/sec sampled sound file takes more than an hour to transmit at 1,200 bit/sec.

New networking technologies will help bridge the gap between performers and sound studios. As networking within and between studios becomes more sophisticated, musicians and engineers will be able to create "virtual studios" that incorporate all types of digital devices, whether they are in the next room or halfway around the world.

Then the music industry will have truly caught up with the communications revolution. □

MIDI helps musicians get the connection

When digital recording techniques were being adopted by musicians and sound studios during the early 1980s, several music synthesizer manufacturers collaborated on inventing a universal interface for electronic musical instruments — the Musical Instrument Digital Interface (MIDI).

Prior to this, the closest thing to a standard connector for electronic musical devices was the RS-232 coupler, a relatively slow (19.2K bit/sec) interface that is not strictly standardized between manufacturers and has no built-in ground-loop prevention to keep out digital noise interference. MIDI provided an asynchronous, serial data transfer protocol that operates at 31.25K bit/sec on twisted-pair cables.

Initially, MIDI's purpose was to give musicians simultaneous,

real-time control of several music synthesizers from a single centralized keyboard. Soon after MIDI was developed, equipment manufacturers found ways to use instruments other than a keyboard to control devices.

The controlling instrument now can be any instrument or device that has been outfitted with MIDI equipment, including traditional acoustic instruments.

It wasn't long before personal computers were added to the list of devices that could be used to play or control MIDI devices. A flexible and complex music system can be created by linking musical devices via MIDI with various manufacturers' software programs and hardware, including recording studio control consoles.

— Kris Herbst

Letters

continued from page 35

Second, it suggests that price cap regulation is the best alternative to rate-of-return regulation.

If the FCC were more vigilant about enforcing its existing rate-of-return regulations, ratepayers would enjoy lower rates under rate-based regulation. In fact, studies done by users groups, such as the International Communications Association, have shown that rate-based regulation will result in lower rates for consumers than the price cap plan.

In addition, the existing rates, which form the starting point for the FCC's price cap plan, are inflated. They contain excess profits, as well as subsidies for both the RBHCs' affiliated ventures and their lobbying costs for seeking legislation from Congress that will lift the Modified Final Judgment restrictions.

Meanwhile, the FCC has failed to enforce its other regulations and carry out its obligations under the Communications Act of 1934. For example, the FCC has failed to act on numerous complaints against the RBHCs for overearnings and failure to provide equal access. All the regulations and statutes in the world are meaningless if the agency that is supposed to carry them out does not do so expeditiously.

The FCC's ability to regulate the RBHCs is of great concern. Contrary to the information in Pearce's column, the FCC today is more lenient in regulating the RBHCs than it was in 1982, when the antitrust court first entered the Modified Final Judgment.

Pearce and Chairman Sikes should study the facts more close-

ly, rather than relying upon the myths that the monopolistic, ratepayer-financed RBHCs seek to perpetuate.

Roy Morris
Director of public policy
and government affairs
Allnet Communications
Services, Inc.
Washington, D.C.

Alan Pearce replies:

Only time will tell whether or not I incorrectly interpreted the recent Washington, D.C. Circuit Court of Appeals' remand of U.S. District Court Judge Harold Greene's triennial review opinion.

I believe, as I stated in the column, that the Modified Final Judgment is now short-lived. It will either be overruled by a higher court, changed by Greene or essentially abolished by Congress.

I suspect that almost everyone would disagree with Roy Morris regarding the Federal Communications Commission's effectiveness as a regulatory body under Chairman Alfred Sikes.

The Sikes commission is significantly more effective than that of either Mark Fowler or Dennis Patrick.

Sikes is not only committed to enforcing the Communications Act of 1934 and Volume 47 of the Code of Federal Regulations, but also to encouraging and dealing with complaints filed under Section 208 of the act.

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The taming of telecom

continued from page 45

new services will operate. The FCC, say the experts, must win these policy battles. Otherwise, overregulation and policy chaos will result.

■ Most states will leave the long-haul telecommunications market to federal regulation, largely because competition is a fait accompli.

A senior attorney with Bell Atlantic Corp., who requested anonymity and who handles federal/state jurisdictional disputes, explains the policy problems surrounding federal/state regulation. "Who regulates ONA and the enhanced services that Computer III is supposed to generate?" he asks. "This question is still largely unresolved, even though the FCC says it must establish a national public policy framework so that it can deal with international problems when and if they arise."

The Ninth Circuit Court of Appeals recently reversed the FCC decision concerning the abolition of RBHC separate subsidiaries for the provision of enhanced services once ONA is implemented. The California Public Utility Commission (PUC) claimed that state regulators, not the FCC, should decide whether the RBHCs should offer information services via a separate subsidiary.

This reversal of FCC policy has thrown Computer III into disarray. An FCC spokesman says, "We are considering an appeal to the Supreme Court or seeking the help of Congress in order to establish our authority over the future provision of information-age services."

The Computer III dispute is typical of most policy disputes between state PUCs and the FCC. The state PUCs invariably claim that the FCC is exceeding its authority under the Communications Act of 1934. They also claim that the policy is not supported by the record gathered by the FCC, that it is arbitrary and capricious, and that it is contrary to another statute or in violation of constitutional rights.

However, the FCC asserts that state regulation is an obstacle to federal objectives. An implicit federal barrier to state regulation exists in this area. The FCC also maintains that Congress occupies the field; therefore, as the creature of Congress, FCC policy must prevail.

In Computer III, the FCC maintains that information services are peripheral to communications services and, therefore, are not within the regulatory authority of the states. The Ninth Circuit Court of Appeals determined that the FCC action abolishing separate subsidiaries for enhanced services was arbitrary and capricious.

State regulators, for the most part, are not concerned with a national or international vision, according to Professor Eli Noam of Columbia University's Graduate School of Business.

Noam, who recently left the New York Public Service Commission, says many state commissioners are either elected or appointed by the governor. Therefore, their main concern is low telephone rates, as opposed to technological, business, and international trade and standards issues.

Unresolved issues

There will continue to be public policy issues that must or should be resolved. These issues include future network standards (both domestic and international), the introduction of Integrated Services Digital Network, Signaling System 7 and

the Intelligent Network II, along with fiber to the home.

Nynex's Ferguson warns that countries such as Japan and France are outdoing and outspending the U.S. in telecommunications. "They understand that information is powerful," he says.

By 2015, for example, Japan plans to spend \$200 billion — the equivalent of \$22 million a day — to upgrade its public network. "When they are finished, every Japanese home will be connected to the network with optical fiber and have access to a wide world of advanced communications and information services," Ferguson claims.

Many telecommunications policy experts disagree with Ferguson's Armageddon scenario. Some suggest that he is

merely indulging in scare tactics to get Congress to act to free the RBHCs from the line-of-business restrictions imposed by the Modified Final Judgment.

But everyone agrees that problems with standards-setting could impede the development of a global information and telecommunications network.

A Siemens AG spokesman, who requested anonymity, says, "If the standards issues can be resolved, then I'm optimistic about the future. I disagree with the doomsday seers and those who warn that the sky is falling. It won't."

Empowering users

Will all of this help or hurt users? There is unanimity here: If Congress, the FCC, the courts and, to a lesser extent, the state

PUCs do the right things, then users will reign supreme.

Economist George Gilder, a senior fellow at the Hudson Institute, headquartered in Indianapolis, sums up this principle by asking, "Did the national highway system inhibit transportation, and did it reduce the power of individuals to travel and control their own travel plans? No. Similarly, the fiber network will empower communicators and people who want to transmit information."

Des Hudson, president of Northern Telecom World Trade, a subsidiary of Northern Telecom, Ltd. of Mississauga, Ont., says, "In the future, the public networks will provide whatever pipeline is needed by a customer and make it as accessible as a simple voice call." ■

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3Com maps strategy for coexistence

continued from page 1

"3Com needs to return to its roots as an independent data networking company," said Benhamou. "The [network operating system] wars have obscured a lot of 3Com's strengths, such as transmission hardware, bridges, gateways and network management."

These products can add as much value to NetWare as they can to LAN Manager, and 3Com evidently has no more qualms about marketing them accordingly.

This is a dramatic reversal from several years ago when 3Com, determined to supplant NetWare with its own 3+ net operating system, terminated a profitable OEM

relationship with Novell, said Craig Burton, a former Novell executive who is now chief executive officer of Clarke Burton Corp., a consulting firm in Salt Lake City.

"I think Novell was 3Com's biggest customer then, buying \$4 million or \$5 million worth of boards each month," he said.

3Com's rejection of Novell was not mirrored by users, who simply went to other sources for 3Com adapters to use in NetWare local-area networks. And 3Com's shift to a new net operating system based on Microsoft Corp.'s OS/2 LAN Manager did not markedly change the situation.

"If you look back a couple of years to the original LAN Manager announcement [that] Microsoft and 3Com made, we were going to annihilate Novell and the battle was going to be over in a matter of hours,"

said Mike Murray, general manager of Microsoft's network business unit.

Instead, Novell's market share continued to grow and users gradually drove home a hard lesson to the network industry: New technologies, no matter how good they may look, do not stand much of a chance if they do not offer a measure of interoperability with existing products.

Connection tools

3+Open Connection for NetWare is software that couples Novell's native Internetwork Packet Exchange (IPX) transport protocol with the 3Com/Microsoft Network Driver Interface Specification (NDIS) and then adds it to the options available under 3+Open's Demand Protocol Architecture (DPA). 3+Open's DPA

lets client workstations load different transport protocols concurrently and switch among them without rebooting.

This in turn enables clients to access dissimilar hosts over a single physical net.

The Unix connectivity is provided by another new product, dubbed 3+Open TCP with DPA, which gives LAN Manager users the client/server protocols they need to operate in a Transmission Control Protocol/Internet Protocol environment and share files with Unix hosts. 3Com also introduced 3+Open/XNS, which enables 3+Open users to access resources on Xerox Corp. Xerox Network Systems nets.

The new TCP/IP and XNS protocol stacks are mapped to NDIS and work with any product that supports NDIS. With 3Com's new IPX stack, this includes NetWare. Thus, NetWare users can employ 3Com's DPA to get connectivity to TCP/IP and XNS environments, even if they do not have LAN Manager servers.

Available in August, 3+Open Connection for NetWare ranges in price from \$250 for a single user to \$2,195 for a server license. 3+Open TCP with DPA is scheduled to be available in July at prices ranging from \$350 for one user to \$2,995 for 30 users. 3+Open/XNS is scheduled for release next month and will cost \$350 for a single-user license and \$1,995 for a 30-user license.

3Com's new 3+Open Directory is a global naming service based on the X.500 standard. It includes a conversion facility that enables users to migrate name data from 3Com's existing 3+Name and 3+Open Name directory products.

3Com is striking out on its own with 3+Open Directory, while Microsoft has announced plans to build a global naming service into the generic LAN Manager product. It is not clear how compatible the two technologies will be.

"We are responding to our customers, who say they can't wait 18 months to two years while Microsoft decides what to do about directory services," said Eugene Buechle, vice-president and general manager of 3Com's Management, Messaging and Connectivity Division. "However, both of us are tracking X.500 closely so our products shouldn't be too far apart."

Murray added, "We don't know at this point how much like the 3Com product our naming service will be or if ours will be the 3Com product. However, users are indicating that a directory service should be part of the core OS."

By contrast, Buechle said, 3Com believes it is important to implement a global naming service as a separate module so it can be ported to different operating systems and eventually span a multivendor network environment.

3Com also announced 3+Open Menus, a menuing system developed by Saber Software, Inc. It is being positioned as a point-and-shoot interface that will make it easier for users to access resources on multivendor networks.

The directory service and menuing system are scheduled to be available this fall.

Finally, 3Com said 3+Open for Macintosh, which gives Macintosh clients access to LAN Manager, is available now. It implements Apple Computer, Inc.'s AppleTalk Filing Protocol and Printer Access Protocol in the LAN Manager server, making that server look like an AppleShare server to the Macintosh client. Through July 31, 3+Open for Macintosh is being bundled with 3+Open. During that time, current 3+Open 1.1 users can buy the product for \$250. On Aug. 1, it will cost \$1,195. **□**

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AT&T

The right choice.

IBM cements SNA, OSI ties

continued from page 1

statement on NW board," this page).

"The significance of the announcements is the demonstration of IBM's commitment to provide open networks through international standards," said Kevin Moonan, IBM's marketing and services director for the Communication Systems division. "We will do this while continuing to provide comprehensive network management with enhancements to NetView and with broad support for multivendor networks."

Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C. consultancy, said the company is "trying to quell suspicion that IBM is proprietary. IBM is no longer sitting there wallowing in a proprietary mode."

Melding SNA, OSI

IBM's key SNA/OSI announcement last week was VTAM Version 3 OSI Remote Programming Interface Feature. The software lets OSI applications run atop IBM mainframe operating systems and communicate with other OSI hosts via a mainframe running IBM's OSI/Communications Subsystem, according to Donald Holtz, manager of multivendor products for IBM's Communication Systems division.

The product is intended to support distributed applications that involve an SNA mainframe and an OSI host from any vendor, he said. But users are not required to run OSI/Communications Subsystem on every host that runs OSI applications.

The new VTAM software enables an SNA host supporting an OSI application to establish an LU 6.2 link to a host running OSI/Communications Subsystem, which builds the protocols required to communicate with the OSI system, Holtz said.

That lets users employ existing SNA networks to exchange data with OSI hosts. In addition, it obviates the need to install OSI/Communications Subsystem, which is significantly more expensive than the new VTAM software, on every host supporting OSI applications.

"This is one of the big ways that we're trying to add OSI into

SNA," Holtz said. "Our customers can choose the speed at which they add OSI to the network. They can put it at the boundary nodes; they can put it in half of their nodes if they want to. We're giving them the choice."

Atul Kapoor, vice-president of Kaptronix, Inc., a consultancy in Haworth, N.J., said the announcement along with IBM's position statements show a real commitment to OSI. "IBM has clearly placed itself ahead of any other vendor on OSI support," he said.

However, Kapoor questioned what kind of response time users could expect when using the new VTAM software. Holtz said IBM hasn't thoroughly studied the issue, but he said, "The effect of doing this has to be compared to the alternative, and there really isn't one at this point, other than installing [OSI/Communications Subsystem] everywhere in an SNA net."

"IBM is no longer sitting there wallowing in a proprietary mode,"
Dzubeck said.



He also said IBM is working to enhance OSI/Communications Subsystem, which today supports only X.25 links to OSI hosts, with the addition of local-area network support.

VTAM Version 3 OSI Remote Programming Interface Feature ranges in price from \$17,000 to \$40,000 for MVS/ESA, from \$11,000 to \$31,000 for MVS/XA, and from \$1,855 to \$10,000 for VM/SP. Both MVS versions will be available this week. The VM/SP version is scheduled to be available Sept. 28. OSI/Communications Subsystem pricing starts at \$80,130 for MVS and \$9,985 for VM/SP.

TCP/IP face-lift

IBM kept a promise made in January by announcing that NetView will support the TCP/IP Simple Network Management Protocol (SNMP), which will enable NetView to act as a focal point for monitoring and controlling any device on a TCP/IP net

that supports SNMP. The new software, dubbed TCP/IP Version 2 for VM, can also feed SNMP management data from devices attached to an IBM host to a TCP/IP net management system.

Users can employ NetView Command Lists (CLists) to automate responses to alarms or to filter alarms before they reach the net management console. A sample set of CLists is provided with TCP/IP Version 2 for VM.

NetView console operators will use a combination of both native NetView commands and SNMP command structures to monitor and control TCP/IP nets. "The key thing is that we've made full SNMP available to the NetView operator and system," Holtz said.

IBM beefed up the security features of its VM TCP/IP software by adding support for Kerberos, a security function that lets a client/server pair verify each other's authenticity. Moreover, within the Sun Microsystems, Inc. Network File System server capability of its TCP/IP offering, IBM added support for its own Resource Access Control Facility (RACF), a security package that controls access to resources such as data and applications. RACF was previously supported only under the MVS version of TCP/IP.

Other enhancements to TCP/IP Version 2 for VM include support for the Network Computing System remote procedure call library from the Apollo Division of Hewlett-Packard Co., which can be used for distributed applications, and support for TCP/IP's Routing Information Protocol, which lets a VM system serve as an IP router.

TCP/IP Version 2 for VM is scheduled to ship Dec. 28. Its onetime pricing ranges from \$15,200 to \$35,840. Monthly rental fees range from \$317 to \$747, depending on the processor size. IBM said it would offer the same features under MVS at an unspecified future date.

IBM's new AIX OSI Messaging and Filing/6000 is an implementation of OSI Layers 3 through 7 for the IBM AIX Version 3 for RISC System/6000 operating system, a version of Unix that runs on IBM's powerful RISC System/6000 workstations and servers.

The product includes an OSI X.400-based Message Handling
(continued on page 59)

IBM expands LAN support

IBM last week offered an enhanced version of its local-area network workstation software that allows DOS-based personal computers on an Ethernet to access servers running IBM's LAN Server software.

In addition, the vendor also announced upgrades to existing token-ring bridges and network management software.

In a statement of direction, IBM executives said the company will roll out 100M bit/sec Fiber Distributed Data Interface products over the next two years.

The announcements indicate that IBM is expanding its support for LAN standards such as Ethernet and FDDI.

"IBM's announcements fill in a lot of the missing pieces in its local-area network product family," said Frank Dzubeck, president of Communications Network Architects, a Washington, D.C.-based consulting firm.

Among the new products announced was Version 1.2 of the IBM LAN Support Program, which has been enhanced to enable DOS users on Ethernets to access servers on the LAN that support IBM's LAN Server network operating system, according to John McElroy, director of LANs in IBM's Communication Systems division. Previously, only OS/2 workstation users on Ethernet LANs could access the resources of a server running IBM's LAN Server software.

The new version also lets DOS workstation users residing on an Ethernet share file and print services, and electronic mail messages for the first time with DOS and OS/2 workstation users on IBM Token-Ring Networks, McElroy noted.

"We recognize that many of our users have Ethernets installed at their sites and they're not going to throw them away," McElroy said.

The software resides on any Personal Computer AT, XT or Personal System/2 equipped with an Ethernet adapter supporting 3Com Corp.'s Network Driver Interface Specification.

IBM's LAN Support Program Version 1.2 is expected to ship July 27. It will be bundled with new copies of the IBM PC LAN Server network operating system software shipped after July. It is also sold separately for \$66; additional software licenses are priced at \$44.

IBM also introduced new network management software, called the Distributed Console Access Facility (DCAF) Version 1.0, that allows network administrators to manage remote 4M and 16M bit/sec IBM Token-Rings from a central site.

The DCAF software runs on a DOS- or OS/2-based network

management workstation residing on an OS/2 Extended Edition Version 1.1 LAN. DCAF lets the network administrator control and monitor any Network Basic I/O System-based computer on the net.

The software includes a hot-key capability that lets network administrators establish a session between their system and any computer on the network.

The DCAF net management software also has a file-transfer function that enables the administrator to download to the net control console the results of diagnostic tests run on workstations in the net. These files contain data-transfer and error rates for an individual workstation that let the net administrator determine the nature and origin of any problems.

DCAF Version 1.0 is scheduled to ship in November and costs \$135 for the first software package; additional licenses cost \$95 each.

IBM also introduced an enhanced version of its current network management Token-Ring Network Trace and Performance Adapter that allows net administrators to monitor and manage 16M bit/sec IBM Token-Ring Networks.

The earlier version of the Trace and Performance Adapter only handled 4M bit/sec IBM Token-Ring diagnostics, said Jane Celly-Sharp, IBM's LAN marketing manager.

The 16/4 Trace and Performance Adapter provides users with such diagnostic information as data frame and packet analysis.

The Token-Ring Network 16/4 Trace and Performance Adapter can be installed on any IBM Personal Computer AT, XT or PS/2. It ships this month and costs \$1,220.

IBM also unveiled Version 2.2 of its Token-Ring Bridge Program. The software has been enhanced to allow users to connect two remote Token-Ring LANs via dial-up connections for the first time.

The Token-Ring Bridge Program Version 2.0 only allowed users to connect two remote Token-Ring Networks via more expensive leased-line connections at speeds ranging from 9.6K bit/sec to T-1.

Dial-up support is provided through a V.25 bis modem such as IBM's new 19.2K bit/sec V.32 modem. Speeds for dial-up support are modem-dependent.

The Token-Ring Bridge Program Version 2.2 is expected to ship in September and cost \$1,750. Users can purchase an upgrade from the existing Token-Ring Network Bridge Program Version 2.0 for \$335.

— Laura DiDio

Accessing IBM's statement on NW board

Network World has posted on its electronic bulletin board IBM's position statement concerning Open Systems Interconnection, which subscribers can read on-line or download for future reference.

The board can be accessed at 2,400 bit/sec by dialing (508) 620-1160 or (508) 620-1175,

or at speeds up to 19.2K bit/sec (V.32) at (508) 620-1178.

The file is appended to Message 301 in the Open Forum. Select "Open Forum" at the main menu and then the READ option. At the next prompt, select "Individual Messages" and enter 301, the message number.

Next, select "E" to access the

"Enclosed File: IBMOSI." The board will ask you to choose one of nine options. No. 1 will enable you to read the document on-line. The other options will let you download the file.

If you have trouble accessing the board, call Jeff Pennett or Jack McDonough at (508) 875-6400. ☐

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**"A DSU THAT
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Needs outrun net staffers

continued from page 1

panies are cutting back on staff in an effort to trim costs, putting even more strain on network groups that are already bogged down handling routine operational tasks such as moves, adds and changes.

The growing development backlog is causing many net managers to consider outsourcing or long-term operations contracts. By handing over daily responsibility for running the net, network departments can focus their resources on developing strategic applications and improving corporate competitiveness.

Some companies are shifting IS workers into networking to meet the growing demand for network applications without increasing head count. Others have been forced to prioritize development requests according to the expected payback to the company and are asking users with low-payback applications to wait.

The application development backlog in IS hovers between 18 to 24 months in many large firms, according to George Colony, president of Forrester Research, Inc., a market research firm in Cambridge, Mass. While similar research has yet to be done on the backlog in networking, Colony said many companies are finding it difficult to keep pace with the growing user demand for network systems.

"You always hear about the application backlog in IS, but the same thing is happening in telecommunications," said Bernie Schneider, director of telecommunications at United Stationers, Inc. in Des Plaines, Ill.

During the past two years, Schneider and his staff have been called on to deploy and maintain a much greater number and vari-

ety of network technologies, including two-way radios and bar coding for use in warehouses, as well as LANs for most corporate departments.

"Users are really pushing us," Schneider said. "Generally, they understand, but occasionally they've yelled about our lead times."

Schneider said he would like to outsource operation of the firm's backbone net in the next 18 months. This would free up his staff — which has grown 25% in the last two years — to develop strategic network applications instead of doing routine maintenance and net management.

As a first step in that direction, Schneider recently signed a three-year custom network contract with US Sprint Communications Co. to handle much of the firm's voice and data communications.

Previously, United Stationers split the traffic between US Sprint and AT&T.

Under the contract, US Sprint agreed to handle many of the administrative chores that United Stationers' network staff previously handled, such as producing reports.

Charlie Snell, director of computing and communications services at Harris Corp. in Melbourne, Fla., said his staff doesn't have the time to develop all the sophisticated network applications requested by users.

"We're missing opportunities because we don't have time to chase them all down," Snell said.

He said he is currently considering outsourcing certain network functions to a vendor, adding that outsourcing could reduce costs and improve the utilization of staff resources.

Rather than outsourcing operations, Hughes Aircraft Co. has reassigned IS specialists to networking projects, according to

Pete Donaghy, manager of user services and support at Hughes. While this requires the company to retrain employees, it has enabled Hughes to keep up with the demand for strategic network applications.

Hughes also structures its operations so that one group focuses on developing strategic net applications while another group, composed of technicians and analysts, handles routine net management and administrative jobs.

According to Patrick Springer, director of industry services consulting at Computer Task Group/TMC in Needham Heights, Mass., this arrangement makes sense because it keeps the strategic development group from getting bogged down in maintenance activities.

"You have to build a wall between the maintenance of existing applications and systems development," he said. "You can't keep the old vehicle running while you are trying to build a new one."

Gus Bender, second vice-president of telecommunications at The Travelers Corp. in Hartford, Conn., said the increasing diversity and complexity of network technology, combined with corporate downsizing measures, is making it more difficult to meet user demands for applications.

However, managers confronting an applications backlog should explain their situation to upper management and ask for additional resources, Springer said. If they don't, they could be blamed for letting the backlog occur.

Springer added that managers should enlist the aid of end users to help justify the need for additional investment in equipment or staff resources. Users can help point out how the business will ultimately benefit from such an investment, he said. ■

a LAN, whereas DECconnect recommended thin-wire Ethernet. Open DECconnect also uses industry-standard RJ-45 connectors, whereas DECconnect used proprietary connectors, explained Gail Daniels, DEC's group marketing manager for telecommunications and networks.

Open DECconnect Cabling Support is designed for interoperability with thick- and thin-wire Ethernet installations. The components are scheduled to be available at the end of July. Pricing will depend on configuration.

DEC's PC Expo product blitz included a DECnet portal that enables NetWare LANs to communicate over a DECnet network by encapsulating Integrated Packet Exchange/Sequenced Packet Exchange (IPX/SPX) data in wide-area DECnet protocol format.

The product, known as the DECnet/IPX Portal, runs on two VAXes that reside on Ethernets supporting NetWare. One VAX encapsulates IPX data before it is

routed across wide-area lines supporting DECnet routing protocols, while the other receives the data and strips away the DECnet packet before presenting it to a NetWare server.

DECnet/IPX Portal was developed and will be serviced by InterConnections, Inc. of Bellevue, Wash.

The software is available now, and pricing ranges between \$1,200 and \$3,500, depending on VAX processor model.

Finally, the company introduced Digital Standard MUMPS Direct Data Path-DOS, software that runs on IBM Personal Computer ATs. The software enables personal computer application programs to access data over an Ethernet that is stored on a MUMPS data base residing on a VAX or PDP-11.

A single-user license of the software costs \$130, and a onetime right to copy it costs \$111. The software is available now. ■

RBHC investments rankle users

continued from page 1

Last week, Bell Atlantic International announced that it is co-operating with US West, Inc. and the government of Czechoslovakia to build a packet-switched network in that country, an effort that will cost \$45 million over 10 years.

The deal follows a similar 10-year, \$60 million venture the three parties started earlier this month to build a cellular mobile network there (see "RBHCs help Czechoslovakia build cellular mobile net," page 27).

Scores of other RBHC ventures have been launched in locations as diverse as Hong Kong, Hungary and the U.K.

"We think our opportunities for financial growth are better abroad than they are here," said Hyde Tucker, Bell Atlantic International's president and chief executive officer. "We plan to be getting about 10% of our revenue from international operations within five years." That figure is about 1% today.

The business rationale

The RBHCs argue that overseas investments have more profit potential than domestic investments in local loop services. Financial analysts generally agree, saying that many foreign markets are underdeveloped and poised for growth, while the U.S. market is maturing.

"The RBHCs are acting like rational businessmen," according to Peter Bernstein, senior analyst at Probe Research, Inc., a market research firm in Cedar Knolls, N.J. "They're making decisions that they think will earn them the best return on their investment."

But most observers conceded that one of the reasons behind the RBHCs' overseas ventures can be found in domestic regulations that restrict the kinds of businesses they can pursue at home. They argue that if the RBHCs were allowed to take part in such activities as manufacturing equipment, they would pour more money into domestic ventures.

Observers also contend that the RBHCs would invest more money in advanced domestic network services if they were allowed to earn higher profits from local loop services.

"We're seeing a flight of RBHC capital out of this country because of the regulatory environment here," said Patrick Springer, director of industry services consulting at Computer Task Group/TMC in Needham Heights, Mass.

"As a user, I'm concerned, and I think a lot of other users are," said a senior officer with a U.S. users group who requested anonymity. "They're using capital [abroad] that should be plowed back into the public network."

Basically, the only restriction

the RBHCs face abroad is that they must pursue foreign ventures through separate subsidiaries, so that costs from abroad are not written off as costs from domestic services.

But some observers question whether there are adequate safeguards in place to keep local loop costs separate from international costs.

They argue that it is difficult enough to guard against cross-subsidization of nonregulated domestic ventures, to say nothing of trying to police international operations.

"A better regulatory system would mean that they would have less money to send abroad," said Brian Moir, legal counsel for the International Communications Association (ICA).

There is also concern that the RBHCs are using profits from regulated services to fund international ventures, since the RBHCs can spend these profits wherever

RBHC executives argue that overseas investments have more profit potential.

▲▲▲

they want to.

"Investment into new ventures needs to come from equity, not profits from regulated activities," said William Pomeroy, director of public policy for the ICA. "I believe that the RBHCs should be required to reinvest some of these profits into local services."

A spokeswoman for Pacific Telesis Group disputed these contentions.

"Users shouldn't get the idea that we're robbing Peter to pay Paul," she said. "Even if we were to lose our shirts on an overseas project, it would come out of the pockets of shareholders, not ratepayers."

Free to proceed

Despite their concerns, few users say they believe that the RBHCs should be prohibited from expanding internationally. Most simply want regulators to work harder to ensure that money from domestic operations is not used to fund foreign expansions. And in the long run, some observers argue that foreign investments could end up helping U.S. users.

According to Eli Noam, a professor with the Columbia University Business School, "By traveling abroad, [the RBHCs] can pick up some good ideas that could be used to improve service in this country." ■

DEC blitz features 10BaseT

continued from page 4

cess Unit (MAU), which allows any standard Ethernet card to attach to a 10BaseT repeater. The MAU has a 10BaseT connector and an AUI connector, and it functions as a transceiver.

DEC's 10BaseT products are expected to be available in September. DEC EtherWorks Turbo/TP costs \$395; DEC repeater 350 costs \$2,200, or \$18,700 for 10 repeaters; and the MAU costs \$150.

New cabling plan

In a further endorsement of the 10BaseT draft standard, DEC announced Open DECconnect Structured Cabling Support, a wiring system that will supersede the existing DECconnect offering with a wiring plan based on industry standards.

Open DECconnect recommends unshielded twisted pair in

US Sprint files PRI tariff

continued from page 2

has a \$2,000 onetime installation charge and a \$300 monthly fee.

The ANI feature, which enables users to identify the telephone number of the calling party, carries a onetime \$200 installation charge per PRI and costs 1 cent for each number delivered. AT&T charges a \$400 monthly fee for ANI and 2 cents per number delivered.

US Sprint's Call-by-Call Service Access feature has a \$250-per-PRI establishment fee, and users pay \$200 each time they rearrange their trunk group. The feature allows customers to reconfigure B channels to support different services, instead of having to dedicate each channel to a particular service.

AT&T first charged \$250 per PRI for its call-by-call selection feature and \$200 for each rearrangement but eliminated both charges in December 1989.

The last feature, VPN-PBX Interworking, carries a \$100 onetime installation charge per site and is designed for VPN users with ISDN-compliant Northern Telecom, Inc. PBXs, according to John Duff, group manager of enabling technologies at US Sprint. The feature lets users support Station Identification, Network Ring Again and Integrated Access to Switched Digital Services.

The Station Identification feature lets users identify callers behind PBXs. Network Ring Again allows an ISDN subscriber who receives a busy signal to camp on

to that number and complete the call when the station is free. Integrated Access to Switched Digital Service lets US Sprint ISDN customers use the PRI link to access switched 56K and 64K bit/sec digital data services.

One feature US Sprint promised to roll out but has not priced yet is dynamic access to the carrier's SprintNet packet-switched network. This would enable customers to access the carrier's packet data network on a dynamic basis. Currently, customers access this network using dial-up or dedicated links.

US Sprint's ISDN service will be offered to customers served by any of its 268 points of presence, although the carrier only supports PRI on two central office switches — one on each coast. Customers lease access to their nearest serving office, and US Sprint absorbs the cost of linking them via T-1 to a switch.

By comparison, AT&T currently supports PRI service in 322 cities and plans to increase

the number to 343 by year end.

US Sprint's PRI service conforms to Northern Telecom's Primary Rate Access Specification No. NIS-214. Customer premises equipment that doesn't conform can use a protocol converter to switch from one PRI format to the Northern Telecom format.

According to Gartner Group's Baylock, the carrier has tested the compatibility of eight different vendors' PBXs at its Burlingame, Calif., ISDN laboratory ("US Sprint goes public with ISDN test lab," Sept. 4, 1989).

Users said US Sprint's filing will serve as a shot in the arm for PRI. Russell Bowen, telecommunications director for Aetna Life and Casualty Co., a Hartford, Conn.-based insurance firm, said US Sprint's filing puts the pressure on MCI.

"US Sprint is serving as a mover and a shaker by pricing its ISDN service," Bowen said. "Users won't realize the full advantages of ISDN until multiple carriers offer PRI service." □

IBM cements SNA, OSI ties

continued from page 56

System and the OSI File Transfer, Access and Management (FTAM) facility, which allows AIX users to exchange files with any other OSI-based system.

The product runs on RISC System/6000s linked to various networks, including X.25, Ethernet and token-ring nets. It supports the U.S. Government OSI Profile (GOSIP) Version 1 and U.K. GOSIP Version 3.

Included with the software are application-layer gateways that let OSI users exchange mail and files with users of TCP/IP mail and file-transfer applications running on AIX or other Unix-based systems.

Scheduled to ship Dec. 14, AIX OSI Messaging and Filing/6000 costs between \$2,500 and \$12,000, depending on the size of the RISC System/6000. □

Vendors need to improve tools

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tion about the LAN and transmitting it to NetView. It can accept commands from NetView for functions, such as disabling a net adapter that is generating errors.

But, Rajan said, "Today, that's not quite adequate." He said large LAN users need such products as sophisticated software distribution tools to simplify the task of updating or installing software across a network.

IBM last week took another step toward improving LAN management with the introduction of a product called Distributed Control Access Facility, software that enables a workstation to take control of any node on a remote token-ring network that is also running the software.

Rajan said that over the next two years, IBM will provide a number of NetView-related tools that deliver that level of integration. The challenge is bringing the company's wide-ranging product lines under a single umbrella. "That's one of the reasons [why] at this point in time, you might find that we are not quite together with LAN Server [IBM's OS/2-based operating system] or

some other products," he said.

Bernard Harguindeguy, product line manager for Novell, said vendors have failed users by not providing a single console to view data from the entire net. "A lot of vendors are providing tools, but they're not integrated," he said.

Novell recently took a step in that direction with the introduction of its NetWare 386 Communication Services, which will enable alarms to be sent to NetView from a NetWare node, he said. ("Novell, partners air bevy of WAN tools," NW, June 18).

A top DEC official said one major hurdle to tying LANs into DEC's Enterprise Management Architecture (EMA) and other enterprise network control systems is that users currently support a variety of LAN hardware and software, as well as multiple management systems.

"The needs of users are currently being served by the vendors they do business with," said Elaine Hodgdon, product marketing manager for network management at DEC in Littleton, Mass. "The problem is that now they have multivendor operations and each vendor manages its own products well, but users see multiple learning curves."

Hodgdon said products under

DEC's EMA can coexist with other vendors' management systems but they do not provide the level of integration users will need as their networks expand.

For example, with DEC's DECmcc Site Management Station, users can open windows to other management systems via X11, the X Window System protocol supported by DECwindows. But while users can access these systems, they still must know the command structure of each product in order to manipulate it.

The DECmcc Site Management Station is a package of four products that manages DEC equipment such as terminal servers and bridges, and performs Ethernet configuration management and monitoring of Ethernet bandwidth utilization.

DEC will begin shipping in October a tool kit that enables users or vendors to develop software that translates protocols used in their net management systems into EMA format. This allows a DEC VAX to perform tasks such as configuration, performance monitoring and fault reporting for equipment that was previously controlled by another management system ("DEC takes wraps off first EMA wares, adds backers," NW, Nov. 20, 1989). □

User lauds US Sprint PRI

OGDEN, Utah — Matrixx Marketing, Inc., the first user of US Sprint Communications Co.'s ISDN Primary Rate Interface (PRI) service, said the service has equaled the performance of AT&T's ISDN offering that the company began using last year.

Matrixx, a 500-agent telemarketing service bureau, implemented the US Sprint Integrated Services Digital Network service more than two months ago. "It's every bit as good as AT&T's PRI," said Rick Clements, the telecommunications director for Matrixx.

Matrixx and US Sprint technicians installed two PRI links in April between the company's Northern Telecom, Inc. Meridian SL-1 private branch exchange and a Northern Telecom DMS-250 central office switch in the carrier's Cheyenne, Wyo., point of presence (POP).

"The cutover went smoothly," Clements said. "We've received excellent support and customer service from US Sprint. They've been with us every step of the way."

Matrixx receives automatic number identification with 97%

to 99% of all calls received over the PRI links, Clements said. The feature provides the company with the main billing telephone number of the caller, which it can use to search for customer files.

Call-by-call offerings

Matrixx also uses both US Sprint's and AT&T's call-by-call service selection feature. "They work the same way," Clements said. "We've yet to find any difference between them."

Call-by-call service selection enables users to reconfigure traffic-bearing channels in a T-1 PRI trunk to support different services as needed. Before PRI, channels were dedicated to a single service.

Matrixx, formerly known as Nice Corp., began using AT&T's PRI service early last year. The telemarketing service bureau linked its switch here to an ISDN-equipped AT&T Network Systems 4ESS central office switch in AT&T's Salt Lake City POP.

Matrixx plans to eventually convert all its T-1 lines to PRI links, according to Clements.

— Bob Wallace

Tariff 15 takes effect

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a factor in the company's decision to turn down AT&T's offer and switch to MCI. However, he emphasized that MCI's offer was the most attractive.

The controversy surrounding Tariff 15 stems from provisions in the Communications Act of 1934 that prohibit carriers from discriminating among customers in providing service. Opponents of the tariff say a carrier should not be allowed to offer special pricing to a specific user and AT&T should not be allowed to respond to rival off-tariff deals.

"[The FCC] has decided not to decide," said Michael Murphy, director for opportunity analysis and strategic pricing at AT&T.

A spokesman for MCI Communications Corp., which has been a vocal opponent of Tariff 15, said "I don't see how this can be interpreted as a win for AT&T. The RCI Tariff 15 went into effect simply because the clock ran out."

Brian Moir, counsel for the International Communications Association, criticized the FCC's handling of Tariff 15. Since the FCC has left Tariff 15 in legal limbo, users may end up wasting valuable resources negotiating contracts that may later be found illegal, Moir said.

Network officials from RCI could not be reached for comment last week. RCI's Tariff 15 deal includes discounts of 8% on

in-bound Software-Defined Network (SDN) service and 10% on outbound SDN and 800 services.

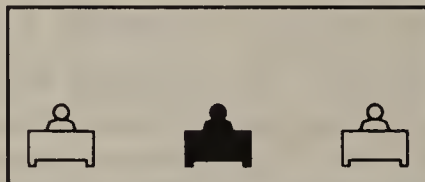
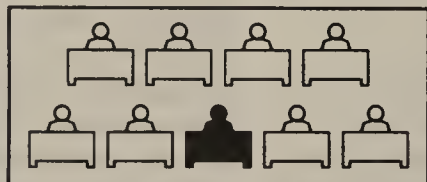
In January, RCI's Tariff 15 deal was suspended by the FCC for five months while the agency investigated legal questions about the tariff. According to FCC rules, if the agency has concerns about the legality of a new offering, it can either reject it outright, allow the service to take effect pending an investigation or suspend it for five months. At the end of five months, the FCC must rule that the tariff is unlawful or it automatically takes effect.

RCI is now AT&T's only Tariff 15 customer, but deals are pending for six others: CBS, The East Ohio Gas Co., La Quinta Motor Inns, Inc., Overseas Military Sales Group and Swift Global Communications, Inc. Even though CBS has gone to another carrier, AT&T has a tariff pending. A Tariff 15 deal for the sixth customer, PepsiCo, Inc., was filed last week.

Sources, including AT&T, speculated that the FCC chose not to issue a decision about Tariff 15 until it could complete a broader proceeding examining AT&T's status as a dominant carrier ("FCC moves to relax regulation of AT&T," NW, March 12).

If Tariff 15 deals are ultimately ruled illegal, it is possible the FCC could require users to pay back any savings earned under the discount plans. Murphy acknowledged that the FCC has the authority to order such payments but said that is unlikely. □

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